UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
SOUTHERN NUCLEAR OPERATING CO.	)	Docket Nos. 52-025-COL & 52-026-COL
(Vogtle Electric Generating Plant, Units 3 and 4)	)	

ORDER
(Adopting Proposed Transcript Corrections, Admitting Post-Hearing Responses, and Closing the Record of the Proceeding)

The Commission held an evidentiary hearing in the uncontested portion of the captioned proceeding at its Rockville, Maryland headquarters on September 27-28, 2011. The parties have provided proposed transcript corrections, in accordance with the deadline previously set.[1] I adopt those transcript corrections proposed by the parties and identified in Appendix A to this Order, as well as additional transcript corrections also identified in Appendix A. Appendix B to this Order contains a revised hearing transcript incorporating all of the adopted corrections.

The parties have timely submitted supplemental responses to in-hearing questions, together with answers to post-hearing questions.[2] As directed, these responses were filed electronically, as new exhibits, using the previously-established numbering scheme. Neither party objected to the admission of these new exhibits.

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[1] *See* Order (Setting Deadline for Proposed Transcript Corrections) (Oct. 3, 2011) (unpublished); *Joint Motion for Transcript Corrections* (Oct. 11, 2011).

[2] *See* Order (Supplemental Responses and Post-Hearing Questions) (Oct. 6, 2011) (unpublished) (Post-Hearing Order); *NRC Staff Responses to Commission Post-Hearing Questions* (Oct. 17, 2011) (NRC000015); *Southern Nuclear Operating Company's Response to the Commission's Order of October 6, 2011* (Oct. 17, 2011) (SNC000011).

Additionally, without objection from the Staff, Southern Nuclear Operating Co. (Southern) subsequently filed a revised version of its post-hearing responses (re-designated SNCR00011).[3] The Staff later filed a letter making revisions to the Final Safety Evaluation Report and to the draft combined license.[4] This letter (with its enclosure) has been assigned exhibit number NRC000016. The Staff's letter stated that Southern has no objection to these revisions.[5] Therefore, pursuant to the Post-Hearing Order, exhibits NRC000015, NRC000016, and SNCR00011 are admitted into the evidentiary record.[6]

The adoption of transcript corrections and the admission into evidence of the new exhibits completes the procedural activities that remained pending at the conclusion of the mandatory hearing. The record of the uncontested portion of this proceeding is closed, effective as of the date of this Order.

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[3] *See Southern Nuclear Operating Company's Request for Leave to File Revised Exhibit* (Oct. 21, 2011); *Southern Nuclear Operating Company's Response to the Commission's Order of October 6, 2011* (dated Oct. 17, 2011, served Oct. 21, 2011) (SNCR00011).

[4] Moulding, Patrick A., Counsel for the NRC Staff, letter to Chairman and Commissioners, U.S. Nuclear Regulatory Commission (Oct. 28, 2011) (Enclosure 1: *NRC Staff Clarifications to the Mandatory Hearing Record*).

[5] *See id*.

[6] *See* Post-Hearing Order at 7-8.

This Order is issued pursuant to my authority under 10 C.F.R. § 2.346(j).

IT IS SO ORDERED.

For the Commission

[NRC Seal]

/RA/

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Andrew L. Bates
Acting Secretary of the Commission

Dated at Rockville, Maryland,
this 1st day of November, 2011.

APPENDIX A: Changes to the Transcript for the Vogtle Mandatory Hearing
September 27 - 28, 2011

Page	Line	Correction
passim		Change “50.54 HH2” to “50.54(hh)(2)”
passim		Change “new start” to “NuStart”
passim		Change “New Start” to “NuStart”
passim		Change “10CFR” to “10 CFR”
passim		Change “WHERUPON” to “WHEREUPON”
passim		Change “staffs’” to “staff’s”
1	4	Change by removing text: Atomic Safety and Licensing Board Panel; Insert "CORRECTED TRANSCRIPT" (underlined)
1	17	Change “trial” to “hearing”
2	9-12	Move the text to be above line 8 (Ms. Sutton appears on behalf of Southern Nuclear Operating Company)
2	14-17	Add Ann Hodgdon, Esq. and Patrick Moulding, Esq. 11555 Rockville Pike, Rockville, Maryland 20852-2738 (They appear on behalf of the staff of the United States Nuclear Regulatory Commission)
3	2	Change “110” to “19”
3	3	Change “131” to “40”
3	3	Change "Schaff" to "Schaaf"
3	4	Change “160” to “69”
3	5	Change “169” to “78”
3	6	Change “171” to “63”; Move line 6 to above line 4
3	7,9	Change “174” to “83”
3	8	Delete "EDDIE GRANT"
3	10	Change “211” to “119”
3	11	Change “212” to “120”
3	12	Change “217” to “125”
3	13	Change “220” to “128”
3	14	Delete entire line
3	15	Delete EDDIE GRANT"; Delete "THOMAS SCARBROUGH"; Change “224” to “132”
3	After line 15	Insert "THOMAS SCARBROUGH"; Insert 133
3	16	Change “239” to “133”
3	17	Change “292” to “183”
3	18	Change “316” to “224”
3	19	Change “320” to “228”
3	20	Change “323” to “182”; Move line 20 to above line 17
4	*passim*	Change “109 109” to “17 17-18”
4	18	Change “SNC000008” to “SNCR00008”
4	22	Change “SNC000010” to “SNCR00010”
5	*passim*	Change "109 109" to "18 18"
6	*passim*	Change "109 109" to "18 18"
9	16	Change "any" to "many"
9	17	Change "comment" to "comments"
10	13	Change “Chair” to “Chairman”
10	15	Change “to call” to “to read - call”
12	7	Change "was called as a witness" to "having been identified as witnesses"

Page	Line	Correction
12	7	Change “Nuclear Regulatory Committee and” to “Southern Nuclear Operating Company”
12	8	Change "having been first duly sworn, assumed the witness stand, was examined" to "individually duly swore or affirmed"
12	9	Delete "and testfied"
13	5	Change “Ray” to “Wray”
14	10	Change “Mrowcaca” to “Mrowca”
14	22	Change "was called as a witness" to "having been identified as witnesses"
14	22	Change “Southern Nuclear Operating Company and” to “the staff of the Nuclear Regulatory Commission”
14	23	Change "having been first duly sworn, assumed the witness stand, was examined" to "individually duly swore or affirmed"
14	24	Delete "and testified"
15	7	Change “Ray” to “Wray”
16	12	Change “Mrowcaca” to “Mrowca”
18	2	Change “applicants” to “applicant’s”
18	3	Change “SNC0000009” to “SNC000009”
18	4	Change “SNCR000008” to “SNCR00008”
18	4	Change “applicants” to “applicant’s”
18	5	Insert "(Whereupon, the documents marked as Exhibits SNC000002 through SNC000007, SNC000009 and SNCR20001, SNCR00008 and SNCR00010 for identification, were admitted into the record.)" after "updated exhibit tables are admitted into the record."
18	7	Change “tabled” to “table”
18	13	Delete entire line
18	14	Delete entire line
18	23	Change “NRC1” to “NRC000001”
18	23	Delete "referred to were"
18	24	Change “NRC10” to “NRC000014”
18	24	Change "identification." to "identification, were admitted into the record."
19	10	Change "was called as a witness" to "were called as witnesses"
19	11	Change "was" to "were"
19	11	Change "having been first duly sworn" to "having been previously duly sworn"
20	19	Change “of” to “reviewing of”
23	2,6	Change “rule making” to “rulemaking”
23	19	Change “mouse [spelled phonetically]” to “analysis”
23	22	Change “intensive R52” to “10 CFR Part 52”
23	25	Change “permits” to “permit”
24	4,6	Change “row is” to “role as”
24	17	Change “could apply” to “could then apply”
24	20	Change “center” to “centered”
24	20	Change “consisted” to “consists”
25	6	Change “NRC early review” to “NRC review”
25	11	Change “TV” to “TVA”
25	17	Change “B three and 4” to “be – 3 and 4”

APPENDIX A: Changes to the Transcript for the Vogtle Mandatory Hearing
September 27 - 28, 2011

Page	Line	Correction
25	20	Change “applicable” to “the applicable”
25	23	Change “port” to “report”
25-26	25,1	“immicable [spelled phonetically]” to “inimicable”
26	4	Change “Industar [phonetic]” to “NuStart”
26	13	Change “permits” to “permit”
26	13	Change “material, as” to “material. As”
26	15	Change “material, the” to “material. The”
26	16	Change “described” to “is”
26	19	Change “older” to “holder”
26	19	Change “in” to “and”
27	1	Change “as back” to “as site back”
27	4	Change “demonstrate the” to “demonstrate that the”
27	6	Change “were” to “where”
28	1	Change “license supplemental” to “license final supplemental”
28	3	Change “no new and additional” to “no additional new and”
29	12	Change “going, training: to “going, and training”
29	14	Change “both maintaining” to “maintaining both”
30	9	Change “delayed” to “delay”
30	14	Change “that’s partially” to “that’s a partially”
30	25	Change “sense, we” to “sense, that we”
31	1	Change “or” to “of”
31	5	Change "GREGORY" to "CHAIRMAN" and change "LACZKO" TO "JACZKO"
31	12	Change “little bit more” to “little more”
31	20	Change “it depends” to “it did depend”
32	10	Change “can take” to “can take is an option”
32	11	Add "?" after "currently"; capitalize "That"
32	17	Change "KRISTINE" TO "COMMISSIONER"
32	20	Change "lengths" to "length"
33	5	Change "d" in "Delta" to lowercase and delete "did that"
33	10	Change “sections specifically” to “sections that’ll be specifically”
33	21	Change "KRISTINE" TO "COMMISSIONER"
34	2,3	Change “was” to “is”
34	4	Change “seam less” to “seamless”
34	6	Change "KRISTINE" TO "COMMISSIONER"
34	9	Change "GEORGE" to "COMMISSIONER"
34	16	Change "GEORGE APOLTOLAKIS" to "COMMISSIONER APOSTOLAKIS"
34	20	Change “you just look at” to “you look at just”
35	5,7	Change “SP” to “ESP”
35	13	Change "GEORGE" to "COMMISSIONER"
35	15	Change "WILLIAM" to "COMMISSIONER"
37	2	Change “received” to “receive”
37	2	Change “made” to “amendment”
37	6	Change “so last year 11” to “so ISG-11”
37	13	Change “now changes” to “now this changes”
37	18	Change “amendments can really” to “amendments really can”
37	23	Change "WILLIAM" to "COMMISSIONER"
37	25	Change "WILLIAM" to "COMMISSIONER"

Page	Line	Correction
38	22	Change "WILLIAM" to "COMMISSIONER"
38	20	Change “that” to “let’s say”
39	23	Change "WILLIAM" to "COMMISSIONER"
40	10	Change “Shaff” to “Schaaf”
40	11	Change "was called as a witness" to "were called as witnesses"
40	12	Change "having been first duly sworn" to "having been previously duly sworn"
40	12	Change "was" to "were"
40	16	Change “Asstulewicz” to “Akstulewicz”
40	18	Change "Enviromental" to "Environmental"
40	19	Change “Shaff” to “Schaaf”
41	5	Change “Shaff” to “Schaaf”
41	23	Change “2,600” to “26,000”
42	6	Insert “impact” between the words “environmental” and “statement”
42	7	Change “provide” to “provided”
42	11	Change “preformed” to “performed”
43	11	Change “Shaff” to “Schaaf”
43	13	Change “slides” to “slide”
43	18	Change “FCR” to “CFR”, Change “The” to “the”
44	3	Change “field” to “backfill”
44	4	Change “mess” to “mats”
44	20	Change “The” to “the”
45	19	Insert “reference” between “AP1000” and “combined”
45	22	Insert “review of the” between “the” and “Bellefonte”
45	25	Change “article” to “RCOL”
46	5	Change “instilling” to “installing”
46	14	Change “and” to “in”
46	15	Change “Secy” to “SECY”
47	2	Insert a period after “NUREG”
47	3	Change “to” to “the”
47	6	Change “article” to “RCOL”
47	8	Change “article” to “RCOL”
47	12	Change “design center” to “design-centered”
47	21-22	Capitalize the first letters to read: “Advisory Committee on Reactor Safeguards”
48	7	Remove “[spelled phonetically]”
48	13	Change “ACR” to “ACRS”
48	22	Change “2001” to “2011”
49	3	Change “basis” to “bases”
49	14	Change “CRF” to “CFR”
49	15	Change “document4ed” to “documented”
49	22	Change “dually” to “duly”; put a “.” after “made” and capitalize “As”
49	23	Change “two” to “to”
50	5	Change “act” to “Act”
50	9	Change “plans” to “plants”
50	24	Change "analagous" to "analogous"
50	24	Change “Schaff” to “Schaaf”
51	5	Change “Schaff” to “Schaaf”

Page	Line	Correction
51	9	Change “this” to “its”
51	11	Change “intensity of” to “10 CFR”
51	12	Delete the word “our”
51	12	Change "1022" to "102(2)"
51	15	Change “5175” to “51.75”
51	17	Change “5192” to “51.92”
51	23	Change "associating" to "associated"
52	4	Insert "a" after "publishing"
52	4-5	Change “federal register” to “Federal Register”
52	9	Change “5126 D” to “51.26(d)”
52	25	Change “finale” to “final”
53	6	Change “FLWAs” to “LWAs”
53	8	Change period after "information" to semi-colon
53	10	Insert a semi-colon after “EIS”
53	10	Change comma after "agencies" to semi-colon
53	13	Change comma after "EIS" to semi-colon
53	14	Change "in" to "and"
53	17	Change ”50.10 A” to “50.10(a)”
53	20	Change "51 107 A" to "51.107(a)"
53	22	Change "available" to "the Vogtle"
53	23	Insert “ NEPA” between “with” and “Section”; Change “102, 2 A” to “102(2)(A)”
54	1	Change "concords" to "comports"
54	2	Delete comma after "10CFR"; Insert comma after "Part 51"
54	3	Change "and" to "in"
54	4	Change "sites" to "SEIS"
54	6	Change "sites" to "SEIS"
54	8	Change "1022 C" to "102(2)(C)
54	10	Insert semi-colon after "action"
54	11	Insert semi-colon after "effects"
54	13	Delete comma after "information"
54	13	Change comma to semi-colon after "review"
54	15	Delete comma after "maintenance"
54	15	Change comma to semi-colon after "productivity"
54	19	Change “if” to “it”
54	19	Delete comma after "NEPA"
54	20	Change "1022 C" to "102(2)(C)
54	22	Delete comma after "NEPA"; Change "1022 E" to "102(2)(E)
55	1	Change “citing” to “siting”
55	2	Change "or" to "on"
55	12	Insert comma after "economic"; Insert comma after "environmental"
55	22	Change “were” to “will”
56	9	Change "need for" to "NEPA"
56	13	Change “cCmmission’s” to “Commission’s”
56	15	Change “folks” to “focus”
57	4	Change “shillbilling” to “shield building”
57	5	Delete “[spelled phonetically]”
59	2	Change “licensed” to “license”

Page	Line	Correction
59	9	Change “affect” to “effect”
59	21	Change “licensed” to “license”
59	23	Change “Change “licensed” to “license”
60	9	Change “licensed commission?” to “license condition.”; Change “hardened” to “hard and”
61	5	Change “they” to “then”
61	22	Insert “I” between “while” and “think”
62	18	Add a period after "transparency"
62	22	Change “overtime” to “over time”
63	8	Change "council" to "counsel" and change "was" to "were"
63	9	Change "council" to "Counsel"
63	16	Change “council” to “counsel”; insert “is” before “that”
64	7	Delete the comma after “basis“
64	11	Insert “in the SEIS” after “conclusion.”; delete the period after conclusion
64	13	Add a period after "testimony" and capitalize "T" in "that's"
64	25	Change "wont'" to "won't"
65	3	Change "then" to "the"
65	19	Change “REI” to “RAI”
67	14	Delete "[spelled phonetically]"
68	9	Change “LWA1” to “LWA 1”
68	11	Change “under every” to “in the early”
68	13	Change “-- with the plant” to “plant”
68	14-15	Change “LDBA [spelled phonetically]” to “LWA”
69	9	Change “Southern Nuclear Operating Company” to “the staff of the Nuclear Regulatory Commission”
69	10	Change "having been first duly sworn" to "having been previously duly sworn"
69	14	Change “LWA” to “LWA-1”
69	15	Change “LWA” to “LWA-1”
70	2	Change "SSEs" to "SSCs" and delete "that"
70	13	Insert “It is safe.” after “It’s safe.”
70	15	Capitalize "chairman"
71	2	Change “alternate” to “operating”
71	5	Change “mind” to “mine”
71	10	Change "ourself" to "ourselves"
73	8	Change “50/59” to “50.59”
75	14	Change "protoype" to "rotational"
75	15	Change "Salmon [spelled phonetically]" to "Sanmen"
76	9	Insert a comma after "you" and change "associate" to "associated"
76	10	Change "applicant of" to "applicant on"
76	16	Change "Engineer" to "Engineers" and delete "the" at the end of the line
76	18	Delete "And" and captialize the "T" in "the" before "Department"
76	22	Insert "at" before "the Savannah"
76	24	Change "veiws" to "reviews"; Change "accumulative" to "cumulative"

Page	Line	Correction
78	8	Change speaker identified as "CHAIRMAN JACZKO" to "MICHAEL JOHNSON"
78	11	Change “Southern Nuclear Operating Company” to “the staff of the Nuclear Regulatory Commission”
78	12	Change "having been first duly sworn" to "having been previously duly sworn"
78	17	Change”[unintelligible]” to “mission”
78	21	Change “TDA” to “TVA”
78	22	Change “neap of” to “NEPA”
79	6	Change "than" to "in"; Delete period after NEPA; Change "Then" to "then"
79	7	Change “farms” to “forests”
80	12	Change “Southern Nuclear Operating Company” to “the staff of the Nuclear Regulatory Commission”
80	13	Change "having been first duly sworn" to "having been previously duly sworn"
80	21	Change “actions when” to “accidents than”; Change "and some" to "in terms"
81	19	Change "NEA" to "an EA"; Change “NEIS” to “an EIS”
83	12	Change "was called as a witness" to "were called as witnesses"
83	13	Change "having been first duly sworn" to "having been previously duly sworn"
83	13	Change "was" to "were"
83	16	Change “SCC Mobile Units Three and Four” to “SNC Vogtle Units 3 and 4”
83	19-20	Change “licensing sportly, new start” to “Licensing Support Lead for NuStart”
84	1	Delete “EDDIE GRANT”
84	3	Change "was called as a witness" to "were called as witnesses"
84	4	Change "having been first duly sworn" to "having been previously duly sworn"
84	4	Change "was" to "were"
84	7	Change “[unintelligible]” to “New Reactors”
84	10	Change “construction, engineering, and NRO” to “structural engineering in NRO”
84	14	Change “Chapter” to “Chapters”
84	15-16	Change “Mobile Units Three and Four” to “Vogtle Units 3 and 4”
84	17	Change “quest” to “request”
84	18	Change “license” to “licenses”
84	19	Change “in” to “and”
84	23	Change “licensing” to “license”
84	25	Change “special” to “special nuclear”
85	1	Change “specify” to “specific”
85	2	Change “applicants,” to “applicants”
85	2	Change “provide” to “be provided”
85	3	Change “material” to “materials”
85	3	Change “SCC” to “SNC”
85	7	Change “to this” to “for the”
85	8	Change “COLA [spelled spelled phonetically]” to “COLA”

Page	Line	Correction
85	9,12,13	Change “SR” to “FSAR”
85	13	Change “were” to “was”
85	17	Change “applications, these” to “applications. These”
85	20	Change “[unintelligible]” to “new fuel”
85	23	Change “to qualified” to “to a qualified”
85	25	Delete “[spelled phonetically]”
85	25	Change “manufacture” to “manufacturer”
86	2	Change “by product” to “byproduct”
86	4	Change “10CFR 52103G” to “10 CFR 52.103(g)”
86	5	Change “on any” to “on receipt of any”
86	6	Change “local” to “Vogtle”
86	9	Change “10CFR Part” to “10 CFR Parts”
86	10	Change “explicability” to “applicability”
86	12	Change “these” to “this”
86	12	Change “that requirements” to “that the requirements”
86	14	Change “there’s” to “there is”
86	18	Change “Vogtle two’s” to “the Vogtle COL application”
86	18-19	Change “inner staff guidance, [unintelligible] G23” to “Interim Staff Guidance, ISG-23”
86	20	Change “application” to “applications”
86	24	Delete “[spelled phonetically]”
87	1	Change “controls in” to “controls on”
87	2	Change “S&C” to “SNC”
87	6	Change “global” to “Vogtle”
87	8	Change “characteristics, for” to “characteristics. For”
87	10	Change “in ESP” to “in the ESP”
87	12	Change “and on” to “on”
87	12	Change “and this” to “and in this”
87	13	Change “of we” to “of where we”
87	17	Change “were resolved” to “were not resolved”
87	23	Change “were” to “are”
88	3	Change “comprehensive a listing” to “comprehensive listing”
88	24	Change “approval of” to “approval of a”
89	12,20,25	Change “EPS” to “ESP”
89	25	Delete “what”
89	25	Change “Alfa” to “Alpha”
90	2	Change “design, this” to “design. This”
90	8	Change “scoop” to “scope”
90	19	Change “and” to “and in”
90	21	Change “appendixes” to “appendices”
91	2	Change “Section 33,” to “Section 3.3”
91	2	Change “331” to “3.3-1”
91	9	Change “release” to “relief”
91	24	Change “[unintelligible]” to “safety”
91	25	Change “Heavy” to “Heavily”
92	2	Change “[unintelligible]” to “Electric Generating Plant”
92	5	Delete comma after “FSAR” and un-capitalize the N in “Numerous”
93	2	Change “all” to “or”

Page	Line	Correction
93	22	Add “the” after “against”
93	23	Change “appendix” to “Appendix”
95	14	Insert “STAFF” after “NRC”
95	19	Change “Three And Four” to “Three and Four”
95	21	Change “70.22B” to “70.22(b)”
95	24	Change “70.32C” to “70.32(c)”
96	3	Change “and” to “an”
96	9	Change “70.17A” to “70.17(a)”
97	21	Change “where” to “were”
98	18	Change “[unintelligible]” to “section of the FSAR in which the”
98	24	Change “likely” to “directly”
99	4	Change “plate” to “plated”
99	10	Insert “between the issuance” after “period”
99	17	Change “material” to “materials” and delete the comma after “materials”; Change “licensee” to “licensees”
99	18	Insert a period after “finding”; capitalize the T in the (next word); change “the” (last word in line) to “these”
99	19	Add “are” before “met”
100	18	Delete “all”
100	22	Change “70.22A1” to “70.22(a)(1)”
100	24	Insert “to” after “prior”
101	7	Change “[unintelligible]” to “equipment”
101	8	Change “70.22A7” to “70.22(a)(7)”; Change “A8” to “a (8)”
101	12	Change “50.68B” to “50.68(b)”
101	12	Change “meet” to “meets”
103	6	Change to “[unintelligible]” to “physical”
103	8	Change “made” to “met”
103	9	Change “78.67G” to “73.67(g)”
104	1	Change “aspect” to “aspects”
104	2	Change “review” to “reviewed”
104	13	Insert “issued” after NRC
104	18	Change “include” to “includes”
104	24	Insert “the” after “with”
105	18	Capitalize the first letters of “site safety analysis report”
105	20	Insert “9” after “condition”
105	21	Change “radiances” to “variances”
106	11	Change “Part” to “part”
106	13	Change “value” to “values”
107	1	Change “of” to “for”
107	2	Change “can” to “and”
107	8	Change "specificic" to "specific"
107	10	Change "actual" to "accidental"
107	14	Add "for control room habitability" after "evaluated"
107	16	Insert “site” after “appropriate”
107	18	Delete “[unintelligible] AP100 ACD [unintelligible]” and replace with “versus AP1000 DCD”
107	21	Change “these” to “those”
107	23	Change “the AP1000 ACD” to “revisions to AP1000 DCD”
107	24	Change “Let me just clarify” to “Westinghouse clarified”

Page	Line	Correction
108	4	Change “the” to “this”
108	7	Change “we’re already evaluating” to “temperature values were already evaluated”
108	9	Change “characteristic value remains bounder" to “site values remain bounded”
108	10	Delete the period after “AP1000”; Insert “staff” in between “the” and “found”
108	20	Change “IDR” to “IBR”
108	24	Change “[unintelligible]” to “COL”
109	6	Change “release” to “relief”
109	12	Change “plant chief” to “branch chief”
109	15	Change “stats” to “staff’s”
110	7	Change “aircraft’s” to “aircraft”
110	9	Change “and the fact” to “in the fact”
111	15	Change “[unintelligible]” to “possesses”
111	18	Change “engineer” to “engineering”
112	7	Change “consultant” to “consultants”
113	2	Change “pass” to “path”
113	18	Change “ESPSSAR” to “ESP SSAR”
113	19	Add “material” after “membrane”
114	17	Change “reg” to “rev.”
114	23	Change "methyacrylic [spelled phonetically]" to "methyl methacrylate", and add hyphen after "polymer"
114	24	Add "or" between "asphalt" and "polyurea"
114	25	Change “Shame” to “Shams”
115	2	Change “require” to “requires a”
115	13	Insert “actually” after “8”
115	16	Change “he” to “they”
115	16	Change “[unintelligible] requrie” to “analysis that no prior approval required”
115	17	Change “[unintelligible]” to “the rest of the”
115	18	Change “departure” to “departures”
115	19	Change “application say that [unintelligible]” to “the application actually say that no prior approval”
115	21	Change “[unintelligible]” to “we did our part of”
116	12	Change “FSCR” to “FSAR”; Change “[unintelligible]” to ”3 plants which they have a license for as well as over 30 years of operating”
116	14	Change first “[unintelligible]” to “NSSS vendors”; change second “[unintelligible]” to “A and E as well as the other constructor”
116	19	Change “[unintelligible]” to “our”
117	3	Change “[unintelligible]” to “Applicant’s FSAR”
117	4	Change ““[unintelligible]” to “generic communications”
117	5	Change “request” to “to address”
117	6	Change ““[unintelligible]” to “like generic letters, bulletins”
117	20	Change “[unintelligible]” to “in a case for”
117	24	Change “For” to “Good”
117	24	Add “in” after “give you”
117	25	Change "FSCL" to "FSAR"

Page	Line	Correction
118	1	Change “[unintelligible]” to “inaccessible”; Change “[unintelligible]” to “condition monitoring”
118	4	Change "[unintelligible]" to "that in chapter 8?"
118	5	Change “[unintelligible]” to “We will be”
118	16	Change “[unintelligible]” to “enveloped”
118	17	Change “valve” to “ground”
118	18	Change "exceedences" to "exceedances"
118	18	Change “[inaudible] sector 4 beside” to “response spectra-4 for the site”
118	19	Change “built within” to “dealt with”
119	12	Change “Southern Nuclear Operating Company” to “the Nuclear Regulatory Commission”
119	13	Change "having been first duly sworn" to "having been previously duly sworn"
120	5	Delete "[spelled phonetically]"
120	10	Change "Is the" to "As a"
120	11	Add a comma after "qualifications" and delete "--"
120	18	Delete "," and add "--" after "decommissioning"; delete "what is"; delete "?"; and add "--" after "instrument"
120	19	Change "w" in "With" to lowercase
120	21	Add "?" after "acceptability" and delete "--"
120	24	Change “Southern Nuclear Operating Company” to “the staff of the Nuclear Regulatory Commission”
120	25	Change "having been first duly sworn" to "having been previously duly sworn"
121	3	Change “at” to “in”
121	5	Insert “licensee” after “the”
122	4	Change "a" to "an" and delete "to"
122	11	Change “[inaudible]” to “Yes, take a shot.”
122	13	Change “waterproof a” to “waterproofing”
122	14	Change “[unintelligible]” to “coefficient of”
122	21	Change “reports” to “the report”
123	15	Change “FSER” to “FSAR”
123	16	Change “[unintelligible]” to ”oversight”
124	8	Delete "[spelled phonetically]"
124	11	Change “exemption” to “exception”
124	13	Change “where there’s” to “versus”
124	13	Change “exemption” to “exception”
124	16	Delete both “[unintelligible]”
124	17	Change "plantS" to "plants"
124	20	Change "COMMISSERION" to "COMMISSIONER"
124	21	Change "plant" to "plants" and delete "in effect"
125	2	Change "103G" to "103(g)"
125	3	Delete "before the finding that what"
125	4	Change "think of the" to "I think the"
125	5	Change "and use" to "or use" and change "103G" to "103(g)"
125	6	Change "103G" to "103(g)"
125	10	Delete “[unintelligible]”
125	10	Change “techno” to “technical”

Page	Line	Correction
125	16	Change “Southern Nuclear Operating Company” to “the staff of the Nuclear Regulatory Commission”
125	17	Change "having been first duly sworn" to "having been previously duly sworn"
125	20	Change “NSER” to “NSIR”
126	12	Delete "Paper."
126	17	Change “needed. It” to “needed, and it”
126	17	Change “that we” to “that was”
126	19	Change “we had concurred” to “we concurred”
126	20	Change “[inaudible]” to “were fine with”
127	16	Change "looking" to "looked"
127	17	Delete "in" after "intense"
127	22	Change “all in” to “island”
128	14	Change “main” to “mean”
128	17	Change “[unintelligible]” to “add to that”
128	21	Change “Southern Nuclear Operating Company” to “the staff of the Nuclear Regulatory Commission”
128	22	Change "having been first duly sworn" to "having been previously duly sworn"
129	3	Change “coal” to “COL”
129	13	Change “adaptive” to “a depth of”
130	24	Change “context” to “contents”
132	15	Delete “RAVINDRA JOSHI”
132	19	Delete “THOMAS SCARBROUGH”
132	20	Change "was called as a witness" to "were called as witnesses"
132	21	Change "having been first duly sworn" to "having been previously duly sworn"
132	21	Change "was" to "were"
133	1	Change “CLL [spelled phonetically]” to “COL”
133	3-4	Change “licensing support lead from New Start” to “Licensing Support Lead from NuStart”
133	After line 4	Add: “WHEREUPON, RAVINDRA JOSHI, THOMAS SCARBROUGH were called as witnesses for the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:”
133	5-6	Change “NRC project manager with [unintelligible]” to “senior project manager, Office of New Reactors”
133	15	Change “[unintelligible] Integrity Bands” to “Component Integrity Branch”
133	23	Change “will covering” to “will be covering”
133	23	Change “from three” to “from Chapters three”
133	24	Change “sole” to “soil”
133	25	Change “and action” to “interaction”
133	25	Change “out” to “our”
134	1	Change “for limiter” to “for a limited”
134	1	Change “including a” to “included in”
134	3	Change “insurance” to “engineered”
134	4	Change “feature” to “features”

Page	Line	Correction
134	6	Change “turn over” to “turn it over”
134	8	Change “present a” to “present the”
134	9	Change “sole” to “soil”
134	11,12	Change “sector” to “spectra”
134	16	Change “using” to “used”
134	16	Change “of the structure” to “of structure”
134	20	Change “performed, a” to “performed. A”
134	22	Change “of the acceptability that” to “of acceptability of”
135	1	Change “specific profiles” to “specific soil profiles”
135	8	Change “sore block” to “soil rock”
135	10	Change “in structure” to “in-structure”
135	11	Change “sector” to “spectra”
135	15	Change “clan” to “plan”
135	17	Change “mono” to “model”
135	18	Change “designed” to “design”
135	19-20	Change “in structure” to “in-structure”
135	20	Change “structural” to “in-structure”
135	20,21	Change “sector” to “spectra”
136	3	Change “authorization,” to “authorization”
136	5	Change “this” to “its”
136	10	Change “the 10CRF50.10” to “10 CFR 50.10”
136	11	Change “for a limited” to “for limited”
136	14	Change “other main” to “LWA”
136	15	Change “sharing” to “assuring”
136	17	Change “request” to “requests”
136	19	Change “work,” to “work:”
136	19	Change “reinforce and seal” to “reinforcing steel”
136	19,20	Delete “[spelled phonetically]”
136	20	Change “imbedded” to “embedded”
136	22	Change “island base layers” to “island foundation base slab”
136	23	Change “hearing” to “of preparing”
136	23,24	Change “site allocations” to “COL application”
136	25	Change “were” to “was”
136	25	Change “or” to “and”
136	25	Change “potentially would” to “had the potential”
137	1	Change “change” to “to change”
137	1	Change “ESPEIS” to “ ESP EIS”
137	2	Change “spark 5150” to “CFR 51.50”
137	3	Change “applications” to “application’s”
137	9	Change “ESPFEIS” to “ESP FEIS”
137	11	Change “documents” to “document”
137	12,16	Change “via” to “by”
137	14	Change “go into” to “address one of”
137	18	Change “question” to “questioned”
137	21	Change “adaptability” to “the operability”
137	24	Delete “and”
137	25	Change “valve” to “valves”
138	2	Change “as” to “that the”
138	3	Change “operation” to “operational”

Page	Line	Correction
138	11	Change “describe” to “include”
138	15	Change “systems, quality” to “systems, some quality”
138	16	Change “the FSAR” to “the COL FSAR”
138	17	Change “Lee-Craig [spelled phonetically]” to “leak-rate”
138	17	Change “in 6.6” to “in Section 6.6”
138	20	Change “respectively” to “respectively,”
138	25	Change “ensuring” to “assuring”
138	25	Change “cooling” to “coolant”
139	15	Change “a appropriate” to “appropriate”
139	18	Change “1.96” to “1.196”
139	19	Change “and standard site” to “of standard and site”
139	20	Change “evaluation” to “evaluations”
140	23	Add “the review of” after “involved in”
141	2	Add “standard” after “AP1000”
141	4	Change “site specific” to “site-specific”
141	4, 5	Change “specter” to “spectra”
141	9	Change “general design criteria two” to “General Design Criteria 2”
141	10	Change “phenomenon” to “phenomena”
141	15	Add comma after “beam”
141	20	Change “surround” to “surrounds”
141	25	Change “enveloped form [unintelligible]” to “envelope formed by the”
142	2	Change “construct a response specter” to “compare the in-structure response spectra”
142	2	Change “in structure” to “in-structure”
142	3	Change “specter” to “spectra”
142	4	Change “applicants” to “applicant’s”
142	6, 7	Change “hertz” to “Hertz”
142	11	Change “applicants” to “applicant’s”
142	12	Change “plant” to “plan”
142	17	Delete “predicted levels of”
142	20	Change “island” to “islands”
143	1	Change “sheer” to “shield”
143	1	Change “applicants” to “applicant’s”
143	2	Change “the” to “a”
143	4	Add comma after “that”
143	9	Change “labs” to “slabs”
143	12	Change “50.10D” to “50.10(d)”
143	14	Change “labs” to “slabs”
143	15	Delete “[spelled phonetically]”
143	17	Change “imbedded” to “embedded”
143	19	Change “lab” to “slab”
143	20, 25	Change “labs” to “slabs”
144	1	Add comma after “analysis”
144	3	Change “ACI349” to “ACI 349”
144	4	Change “lab” to “slab”
144	6	Change “labs” to “slabs”
144	8	Change “a” to “the”
144	9	Change “lab” to “slab”

Page	Line	Correction
144	10	Change “section three point eight five” to “Section 3.85”
144	11	Change “FSR section 3.8.5,” to “SER section 3.8.5.”
144	12	Change “consequently” to “Consequently,”
144	13	Change “50.10D” to “50.10(d)”
144	14	Change “labs” to “slabs”
145	2	Delete the comma after “sump”
145	5	Change “QME1 [spelled phonetically]” to “QME-1”
145	7	Change “safe related” to “safety-related”
145	8	Change “QME17” to “QME-1-2007”; Change “three” to “3”
145	10	Change “QME1, 2007” to “QME-1-2007”
145	17	Change “exist” to “exists”;
145	17	Change “squib valves and” to “squib valves are”
145	19	Change “to” to “through”
145	21	Add comma after “Pennsylvania”
146	4	Change “QME1, 2007” to “QME-1-2007”
146	7	Change “that” to “the”
146	8	Change “10CFR50.55A” to “10 CFR 50.55a”
146	9	Change “addition” to “edition”
146	11	Change “of the” to “in”; Change “reactors. That” to “reactors that”
146	15	Change “addition” to “edition”
146	16	Change “50.55A” to “50.55a”
146	22	Add “OM” after “ASME”
146	24	Change “additions” to “editions”
146	24	Delete “a”
147	1	Change “50.55A” to “50.55a”
147	4	Change “Recent” to “Commission”
147	10	Change “to” to “”could”
147	12	Change “50.55A” to “50.55a”
147	15	Change “operating” to “operational”
147	16	Change “10CR50.55A” to “10 CFR 50.55a”
148	2	Change "having been first duly sworn" to "having been previously duly sworn"
148	13	Change “provides” to “provide”
148	21	Add “system” after “cooling”
148	22	Change “design the passive” to “design. The passive”
149	18	Change “lakes” to “legs”
149	25	Change “decayed” to “decay”
150	11	Change “line is” to “lines”
150	20	Change “driving” to “driven”
150	24	Change “to” to “component of”
151	6	Change “annulist [spelled phonetically]” to “annulus”
151	13	Add “the” before “evaporative”
151	18	Change “service” to “surface”
152	2	Change “to revise” to “a revised”
152	5	Change “AC arrest review book reviewed” to “ACRS reviewed both”
152	11	Delete “ability of”
152	19	Change “astringent” to “a stringent”
152	21, 22	Change “installation” to “insulation”

Page	Line	Correction
152	23	Change “reflecting” to “selecting”
152	24	Add “reduction” after “negligible”
153	1	Change “verify” to “verifies”
153	15	Change “vary” to “varied”
153	18	Change “loco” to “LOCA”
153	21	Change “post-loc” to “post-LOCA”
153	22	Change “stats reviews” to “staff’s review is”
153	22	Change “FSER, the ACS review” to “FSER. The ACRS review”
154	2	Change “ACOS” to “ACRS concerns”
154	12	Delete “in” after “found”
154	13	Change “has” to “had”; Delete “to” before “design”
154	14	Add “of” after “use”
155	5	Change “[unintelligible]” to “P_a”
155	19	Delete "[spelled phonetically]"
155	23	Change “are” to “or”
155	24	Change “[unintelligible]” to “χ/Q”
156	10	Change “[unintelligible]” to “an eductor”
156	11	Change “and particulate” to “a particulate”
156	16	Change “not move on the” to “now move on to the”
157	4	Change “was” to “is”
157	9	Change “for work” to “forth”; Change “5046” to “50.46”
157	17	Change “two tier star” to “Tier 2 star”
157	18	Change “text backs” to “Tech specs”
157	22	Change “he toxic chemical” to “the toxic chemicals”
157	25	Change “bi-sulfate has” to “bisulfate had”
161	11	Change “programmatic” to “program”
161	15	Change “FSER” to “FSAR”; Change “IC” to “IST”
161	16	Change “[unintelligible]” to “ASME OM”
162	10	Add “had them” before “specify”
162	15	Change "5059" to 50.59"
162	24	Change “addendum” to “addenda”
163	20	Change “IC” to “IST”
163	25	Change "103G" to "103(g)"
164	5	Change "103G" to "103(g)"
165	7	Change “use” to “used”
165	17	Change “totally” to “total”
166	10	Change “valuable” to “invaluable”
166	16	Insert "to" after "input"
166	25	Change “concern” to “early”
167	6	Change "t" in "This" to lowercase
167	23	Change “steps-by-steps” to “step-by-steps”
168	4	Change "for" to "four"
168	12	Delete "?" and add "." after "Mr. Chairman"
168	17	Change “plan is to” to “plants”
168	19	Change “[unintelligible]” to “liquid”
168	21	Change “valiant” to “propellant”
168	24	Add “and” after “propellant”
169	5	Delete “test” after “times of”
169	6	Change “[unintelligible]” to “testing them”

Page	Line	Correction
169	9	Change “shards” to “charges”
169	14	Change "I mean, my" to "if you mean by"
170	7	Change “INC” to “I&C”
170	16	Change "alter" to "other"
170	23	Change “free-filled” to “free-field”
170	25	Change “free-fill” to “free-field”; Change “[unintelligible]” to “Vogtle”
171	6	Change the comma after "in-structure" to a period'
171	20-21	Change “no SSE’s with relevant” to “no SSCs with resonant”
172	14	Change “call” to “COLA”
172	17	Change “[unintelligible]” to “soil”
173	1-2	Change “free-fill” to “free-field”
173	4	Change “instructure” to “in-structure”
174	7	Delete "are sort of" and "a lot"
174	8	Delete "of -- some"
174	9	Delete "just ask"
174	10	Delete "little"
174	11	Insert "or" between "testing" and "surveillance"
174	16	Change “there at” to “in”; Change “CR” to “SER”
174	17	Change “[unintelligible]” to “valve”
175	1	Change “55A” to “55a”
175	6	Delete “of” after “next”
176	3	Change "definitve" to "definitive"
176	5	Delete ", I guess" and ", you"
176	6	Delete "just said," and change "finite" to "definitive"
176	9	Change "you're" to "you believe that"
177	10	Change “55A” to “55a”
177	10	Change “and add additions to” to “that edition of”
177	11	Add “have” before “the industry”
177	16	Change "application" to "applicant"
177	17	Change “table on” to “table on this”
177	19-20	Change “I technically have” to “that I have technical”
177	21	Change “the as” to “the time as”
177	24	Change “light, consider” to “light, to consider”
177	24	Change “that implementation” to “that for implementation”
178	7	Change “we the FSAR, we our operational” to “we have the FSAR, we have operational”
178	14	Change "Mr." to "Commissioner"
178	19	Change “base” to “basis”
178	20	Change “[unintelligible]” to “earthquake”
178	21	Change “o” to “to”
179	5	Change “use” to “have used”; Change “on” to “at some”
179	12	Change "blister" to "ballistic"
180	10	Change "sore" to "soil"
180	12	Delete the comma and "or" after "AP1000"
180	16	Change “if” to “is”
180	19	Change “bandwidths” to “bandwidth”
181	7	Change “sole” to “soil”
181	9	Change “[unintelligible]” to “media”
181	11	Delete "this" and change "[unintelligible]" to "work"

Page	Line	Correction
181	19	Change "kind of the controlled inhabitability" to "control room habitability"
182	15	Change “probable” to “probabilistic”
182	22	Change “Sparkman, licensing” to “Sparkman, COL licensing”
182	24,25	Change “licensing support lead, New Start” to “Licensing Support Lead, NuStart”
183	1	Change “MROWCACA” to “MROWCA”
183	1	Change “super” to “severe”
183	2	Change “grant” to “branch”
183	3	Change “reliability risk” to “reliability and risk analyst”
183	5	Change “RAVIDRA” to “RAVINDRA”
183	7	Change “Denis” to “Denise”
183	9	Change “MALE SPEAKER: Mark, do” to “CHAIRMAN JACZKO: Do”
183	After line 9	Insert "WHEREUPON, the witnesses for Southern Nuclear Operating Company and for the staff of the Nuclear Regulatory Commission, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:"
183	10	Change “MARK CARUSO” to “WESLEY SPARKMAN”
183	17	Change “rack” to “reactor”
183	17	Change “uncertain” to “uncertainty”
183	17,18	Change “INCK [spelled phonetically] to “I&C key information”
183	18	Change “refernce” to “reference”
183	25	Change “of close to” to “assessment, thus”
184	10	Change “though, of” to “level”
184	11	Change “They get here a peak ground” to “That gives you a peak ground acceleration”
184	14	Change “the” to “a”
184	15	Change “perfection” to “liquefaction”
184	19	Change “screen” to screened”
184	22	Add “Thank You.” (at end of line)
184	23	Change “SR” to “FSAR”
184	24	Change “that site” to “the site”
185	1	Change “results of its” to “resultant”
185	7	Change “plan” to “plant” (both places)
185	8	Change “has” to “it is”
185	11	Change “APPGWGLR 101” to “APP-GW-GLR-101”
185	15	Change “mitigation events” to “mitigation of events”
185	16	Change “Tendency of our 5054” to “10 CFR 50.54”
185	19	Change “fuel cooling” to “fuel pool cooling”
185	22	Change “Vogtle 3” to “Vogtle units 3”
185	23	Change “mitigated” to “mitigative”
185	25	Change “10CFR50.80” to “10 CFR 50.80”
186	1	Change “commissions” to “Commission’s”
186	2	Change “5280” to “52.80”
186	2	Change “and NEI0612” to “in NEI-0612”
186	5	Change “leverage” to “leveraged”
186	5,6	Change “B5B” to “B.5.B.”
186	7	Change “fuel cooling” to “fuel pool cooling”

Page	Line	Correction
186	10	Change “pipe” to “piped”
186	17	Change “and reactor” to “and the reactor”
186	17	Change “and mitigate” to “and to mitigate”
186	18	Change “due to” to “through the”
186	24	Change “address” to “addressing”
187	1	Change “regarded” to “provided”
187	6	Change “REIs” to “RAIs”
187	9	Change “-- [unintelligible] --” to “the VEGP 3 and 4”
187	10	Change “in NEI-06-12” to “Revision 3 of NEI-06-12”
187	11	Change “-- [unintelligible] -- ” to “10 CFR 52.80”
187	17	Change “In response” to “In the responses”
187	23	Change “50-54” to “50.54”
187	25	Change “features this” to “features for this”
188	1,3,6	Change “hard-pipe” to “hard-piped”
188	3,10	Change “a” to “the”
188	15	Change "prtrctionion" to "protection"
188	15	Change “prevention” to “protection”
188	22	Change “process, and” to “process. The”
189	7	Change “Now” to “A”
189	14	Change “installations” to “installation”
189	17	Change “provide” to “provided”
189	21	Delete “a”
190	13	Change “DCD. They were” to “DCD that was”
190	14	Change “Practically,” to “Practically”
190	15	Change “by the DCD and” to “from the DCD in”
191	6	Change “it” to “that”
191	8	Change “identifies” to “identified”
191	9	Change “actions” to “action”
191	20	Change “addressed” to “addresses”
191	21	Change “often” to “also”
191	22	Change “the - - [unintelligible] --” to “by reference the NEI”
191	25	Change “inspections test” to “inspections, tests”
194	1	Change “occurred” to “occur”
194	4	Change “out” to “at”
194	18	Add “response” between “design” and “spectra”
195	24	Change "exceedence" to "exceedance"
195	25	Change “SSEs” to “SSCs”
196	5	Change “ESB” to “ESP”
196	22	Change “pulling” to “polling”
198	12	Change “frequency” to “frequencies”
198	20	Change “main” to “mean”
198	23	Change “probably” to “probable”
199	7	Add “materials” after “hazardous”
200	4	Change "having been first duly sworn" to "having been previously duly sworn"
200	10	Change “we” to “I”
200	14	Change “LOLA -- [unintelligible] –“ to “Vogtle LOLA”
200	16	Change “[unintelligible]” to “Andrukat”
200	18	Change “III and IV” to “3 and 4”

Page	Line	Correction
200	25	Change “1CFR” to “10 CFR”
201	4-5	Change “special information and proven commitments” to “sufficient information, including commitments”
201	6	Change “10CFR52.80(d)” to “10 CFR 52.80(d)”
201	9	Change “or” to “and”
201	9	Change “strategy” to “strategies”
201	16	Change “Internal” to “Interim”
202	6	Change “on” to “of”
202	7	Change “limitation by” to “implementation via”
202	7	Change “in” to “and”
202	22	Add “in” after “included”
203	5	Change “[unintelligible]” to “release of radio”
203	5	Change “activity” to “radioactivity”
203	9	Change “endorse” to “endorsed”
203	20	Change “assessment” to “assessments”
203	25	Change “classifiable safeguard” to “Classified and Safeguards”
204	17	Change “[Unintelligible] – experience to manage – [unintelligible] –“ to “A team of individuals knowledgeable and experienced in matters pertaining to LOLAs”
205	1	Change “under” to “of the”
205	6	Change “[unintelligible]” to “Andrukat”
205	8	Change “10CFR50.150” to “10 CFR 50.150”
205	21	Change “mitigating” to “mitigative”
205	24	Change “[unintelligible]” to “radios,”
205	25	Change “in” to “and”
206	1	Change “[unintelligible]” to “mustering”
206	5	Add “commit to” before “include”
206	9	Change “mitigating” to “mitigative”
206	16	Change “staff” to “staff’s”
206	19	Change “Section 52.80(d) – [inaudible] – basis” to “Section 52.80(d), the regulatory basis”
207	1	Change “and classified” to “unclassified”
207	3	Change “[unintelligible]” to “under 10 CFR 2.390(d).”
207	5	Change “basis” to “bases”
207	23	Change “mitigating” to “mitigative”
208	2	Change “[unintelligible]” to “Maintenance”
208	11	Change “applicant – [unintelligible] –“ to “applicant’s submittal”
209	14	Change “design” to “design-related”
210	18	Change “Bais” to “Basis”
210	21	Change “assume” to “assumes”
211	4	Change “plant” to “the primary”
211	10	Change “CheckPLus” to “CheckPlus”
211	16	Delete “NRC”
212-213	*passim*	Change “XIQ” to “χ/Q” [page 212 lines 12, 13, 17, 19, 24; page 213 lines 1, 5]
212	4	Change “AP100DCD” to “AP1000 DCD”
212	5	Change “10CFR 52. 79(a)(1)” to “10 CFR 52.79(a)(1)”
212	8	Add “Staff’s” before “FSER”
212	12	Change “referred to as” to “which is known as”

Page	Line	Correction
212	14	Change “AP1 000” to “AP1000”
212	15	Change “radiological” to “rad”
212	16	Delete “or rad consequences”
212	21	Change “acomparison” to “a comparison”
213	4	Change “of” to “for”
213	6	Delete “the”
213	11	Change “AP1OOO” to “AP1000”
213	14	Change “continue with” to “cover the”
213	22	Change “INC” to “I & C”
214	14	Change “INC” to “I & C”
216	17	Change “INC” to “I & C”
216	24	Delete “COL”
217	6	Add “via” before “230/500”
217	14	Change “YR5” to “via 5”
217	16	Change “4500” to “500”
217	19	Change “SBA” to “SBAA”
217	24	Delete “COL”
219	22	Change “1 E” to “1E”
220	16	Change "raised -- [unintelligible] --" to "raised, I think in"
221	5	Change “- - ” to “itself.”
221	10	Change "experience -- the -- [unintelligible] --" to "experience. INPO"
221	14	Change “on” to “of”
222	5	Change “[Unintelligible] – comparison?” to “I’ll ask Malcolm Patterson”
222	12	Change “a similar one” to “I had a similar role”
222	13	Delete “as” before “they are”
223	11	Change "define" to "defined"
223	21-22	Change “I just want to add that for individual license condition they do have the information (unintelligible).” to “I just want to add that for each of the individual license conditions they do have implementation milestones like fuel (unintelligible).”
224	11	Change "having been first duly sworn" to "having been previously duly sworn"
224	14	Change “information” to “instrumentation and”
224	15, 16	Change “INC” to “I&C”
224	17	Change “(inaudible)” to “Tech specs allowed outage”
224	18	Change “desk” to “DAS”
224	22	Change “[unintelligible]” to “software”
225	13	Insert "to" after "related"
225	19	Change “I think this is on me” to “This is Amy”
225	20	Change “with” to “with some of”
225	22	Change “applications” to “application”
226	3	Change “AP1000DCD” to “AP1000 DCD”
226	11	Change “(inaudible)” to “for a minimum of”
226	12	Change “the interactions” to “interactions”
226	13	Change “REIs” to “RAIs”
226	23	Insert "how" after "really"
227	2	Insert "a" between "at" and "high"

Page	Line	Correction
227	4-5	Change “it was in” to “using”
227	22	Change “locking” to “blocking”
228	7	Change “was” to “is”
228	8	Change “These” to “Needs to”
228	12	Delete the "a" between "to" and "unit"; capitalize "U" in "unit"; change "force" to "Four"; and change "KB" to "kV"
228	13	Change "switch" to "switchyard"
228	14	Delete the comma after "way"
228	21	Change "having been first duly sworn" to "having been previously duly sworn"
228	23	Change “Tanya” to “Tania”
229	8	Change “regular” to “review”
229	16	Change “in structured” to “in-structure”
229	17	Add “CSDRS” after “the”
229	24	Add “point” after “just a”
230	2	Change "SSC" to "SSE"
230	4	Change “IDR” to “IBR”
230	9	Add “process” after “SSI”
230	21	Change "SSC" to "SSE"; change ".26G" to ".26g"; change "the probability" to "using the probabilistic"
230	23	Change “GNRS” to “GMRS”
232	3	Change "having been first duly sworn" to "having been previously duly sworn"
232	12	Change "[unintelligible]" to "results"
233	1	Change “571H1” to “50.71(h)(1)”
233	10	Change “want make” to “want to make”
233	15	Change “who” to “we”
233	18	Change “perform” to “performed”
233	25	Change “50-54HH” to “50.54(hh)”
234	4	Change “the” to “my”
234	7	Change “Phase 2, Phase 3” to “Phase 2 and Phase 3”
234	9	Change “three” to “three and four”
234	11	Change "to share" to "shared" and delete "Is that?"
234	14	Change “pump would” to “pump, we’d”
234	22	Delete "Have you for this" and capitalize the "F" in "for"
234	23	Delete "periodically"
235	3	Delete “mud"
235	4	Change “not normally be” to “not be normally”
235	5	Change “and, or” to “and/or”
235	6	Change “insure they” to “insure that they”
235	10	Change "do" to "does"
235	11	Delete "low"
235	12	Change "level" to "LOLA"
235	13	Change “the” to “one”
235	20	Change “but” to “and”
235	21	Change “retaining” to “maintaining”; Change “but they haven’t made the commitments” to “and they have made commitments”
235	23	Change “strategists” to “strategies”
235	24	Change “insure” to “ensure”

Page	Line	Correction
236	4	Delete "made a sort of"
236	6	Change "spend" to "spent"
236	23	Change “boiler” to “building”
237	17	Change “range” to “winds”
237	17	Change “[unintelligible]” to “a seiche”
237	25	Change "IMC" to "I and C"
238	4	Change "IMC" to "I and C"
238	15	Change “[unintelligible]” to “Chapter 8”
238	15	Change "[unintelligible]" to "station blackout"
238	19	Change “Tonia” to “Tania”
240	19	Change “ERA” to “PRA”
240	24	Change “feeding” to “exceeding”
241	9	Change "showed" to "mentioned"
241	10	Delete "a part --"
241	11	Insert "right" after "Is that"
241	23	Change “fire” to “failure”
242	2	Change "inpact" to "impacts"
244	4	Change by removing text: Atomic Safety and Licensing Board Panel
244	17	Change “trial” to “hearing”
245	9-12	Move the text to be above line 8 (Ms. Sutton appears on behalf of Southern Nuclear Operating Company)
245	14-18	Add Ann Hodgdon, Esq. and Patrick Moulding, Esq. 11555 Rockville Pike, Rockville, Maryland 20852-2738 (They appear on behalf of the staff of the United States clear Regulatory Commission)
246	2	Change “93” to “248”
246	4	Change “94” to “249”
246	5	Change "ERLINGER" to "ERLANGER"
246	5	Change “131” to “286”
246	6	Change “139” to “294”
246	8	Change “143” to “298”
246	11	Change “191” to “346”
248	1	Change "was called as a witness" to "were called as witnesses"
248	2	Change "having been first duly sworn" to "having been previously duly sworn"
248	2	Change "was" to "were"
248	6, 8	Change “Instant” to “Incident”
248	16	Change "was called as a witness" to "were called as witnesses"
248	17	Change "having been first duly sworn" to "having been previously duly sworn"
248	17	Change "was" to "were"
248	19	Delete “the”
248	21	Change “license supervisor” to “licensing supervisor, Vogtle 3 and 4”
248	22	Change “support license lead” to “Support Licensing Lead”
248	23-24	Change “[inaudible] Mr. Sparkman” to “I guess turn it to you Mr. Sparkman to begin”
249	2	Change “planning and” to “planning and the”

Page	Line	Correction
249	4	Change “system” to “system,”
249	6	Change “first (three) plant” to “first-three-plant”
249	11-12	Change “VCs [spelled phonetically]” to “bases”
249	12	Delete “were”
249	12	Change “as” to “is”
249	14	Change “condition related” to “condition was related”
249	15	Change “departure of” to “departure from”
249	16	Change “for CD” to “DCD”
249	20	Change “action of” to “action on”
249	21	Change “license” to “licensed”
249	22	Change “and” to “in”
249	25	Change “levels” to “level”
249	25	Change “established, but consequently the” to “established. Consequently a”
250	1	Change “licensing” to “license”
250	3	Change “EALs” to “The EALs”
250	4	Change “7-01” to “07-01”
250	5	Change “Task and” to “Passive”
250	5	Change “EALs” to “the EALs”
250	6	Change “the state” to “with state”
250	9	Change “[inaudible] suggested,” to “TSC as did”
250	10	Change “BCD” to “DCD”
250	10	Change “[inaudible]” to “deferred”
250	11	Change “TSE” to “TSC” (both places)
250	12	Change “AD .8-1” to “18.8-1”
250	12	Change “all one” to “follow-on”
250	13	Change “[inaudible]” to “habitability”
250	14	Change “they” to “the”
250	15	Change “have ability” to “habitability”
250	15	Change “to GSE” to “of the TSC”
250	17	Change “TSE” to “TSC”
250	19	Change “relocated” to “to be located”
250	20	Change “ATRS” to “ACRS”
250	20	Change “for” to “for a”
250	21	Change “TSE. We” to “TSC, we”
250	22	Change “Vogtle” to “both”
250	23	Change “Positions” to “The positions”
251	4	Change “TSE” to “TSC”
251	4	Change “grated” to “graded”
251	7	Delete “the”
251	8	Change “and of course” to “in accordance”
251	9	Change “7354E” to “73.54 echo”
251	10	Change “a plant” to “the plan”
251	14	Change “security and” to “security”
251	16	Change “objectives Reg.” to “objectives of Reg.”
251	17	Change “However, AP1000” to “However, the AP1000”
251	18	Change “plant” to “plan”
252	3	Change “other programs” to “other security programs”
252	4	Change “A4 to “Alpha4”

Page	Line	Correction
252	4	Change “He” to “And he”
252	5	Change “of the five [inaudible]” to “other topics”
252	6	Change “Thanks” to “Thank you”
252	10	Change “in” to “in the”
252	13	Change “NRSR” to “in our FSAR”
252	14	Change “SEIL” to “COL”
252	14	Change “a” to “of”
252	17	Change “pads” to “paths”
252	18	Change “seal of” to “COL”
252	18	Change “Matamic” to “Metamic”
252	20	Change “Next” to “The next”
252	20	Change “of” to “for”
253	5	Change “drip” to “draft”
253	6	Change “circulated” to “circulating”
253	7	Change “system is to also provide” to “system also provides”
253	7	Change “for Units” to “for the Units”
253	8	Change “from the circling” to “when the circulating”
253	12	Change “fire,” to “fire”
253	12	Change “de-mineralize” to “de-mineralized”
253	17	Change “COLA” to “The COLA”
253	17	Change “a” to “and”
253	22	Change “10CFR 20.1101B” to “10 CFR 20.1101Bravo”
253	22	Change “use to the extent practical” to “use, to an extent practical,”
253	23	Change “in” to “and”
253	23	Change “control” to “controls”
253	24	Change “principals. To” to “principals to”
254	7	Change “12AA” to “12 Alpha Alpha”
254	8,16	Change “08-08A” to “08-08 Alpha”
254	10	Change “contamination” to “contamination,”
254	18	Change “NEI” to “The NEI”
254	19	Change “established” to “the established”
255	1	Change “criticality,” to “criticality”
255	1	Change “extension” to “ascension”
255	3	Change “and FSAR” to “in FSAR”
255	5	Change “applicants” to “applicant’s”
255	10	Change “size and” to “site-”
255	12	Change “tests” to “tests,”
255	13	Change “not” to “on”
255	14	Change “instance” to “instance,”
255	17	Change “(three)” to “three”
255	20	Delete “I’m”
255	23	Change “and” to “in”
255	25	Change “licensed” to “license”
256	19	Change “CLR” to “COL”
257	8	Change “plan” to “plans”
257	13	Change “plan” to “plant”
257	17	Change “applications” to “application”
257	22	Change “reference” to “referenced”

Page	Line	Correction
258	12	Change “addresses” to “address”
258	14	Change "addresse" to "address"
258	16	Change “path of” to “passive”
258	23	Change “agency’s” to “agencies’ ”
259	2	Change “plan” to “plant”
259	6	Change “licensed” to “license”
259	12	Delete “and”
260	5	Delete "[spelled phonetically]"
260	13	Change “unit” to “unit’s”
261	16	Change “loads” to “load”
262	1	Change “Part 52 of the” to “Part 52, the”
262	9	Change “instant” to “incident”
262	10	Change “established” to “cyber”
262	11	Add “power” after “nuclear”
262	19	Change “7354” to “73.54”
262	22	Change “[inaudible]” to “reactor”
263	2	Change “supports” to “support”
263	8	Change “the past attack” to “the terrorist attacks”
263	18	Change “[unintelligible]” to “Stuxnet”
263	23	Change “[unintelligible] as” to “Stuxnet”
263	25	Change “and” to “at”
264	12	Change “establish” to “cyber”
264	13	Change “[inaudible]” to “reactor”
264	16	Change “devised” to “revised”
264	20	Change “commission issued 10CFR 73-54 established” to “the Commission issued 10 CFR 73.54 cyber”
264	22	Change “[inaudible]” to “performance-based”
264	23	Change “10CFR 7354” to “10 CFR 73.54”
264	25	Change “importance of” to “important to”
264	25	Change “emergence of” to “emergency”
265	2	Change “importance of” to “important to”
265	2	Change “emergence of” to “emergency”
265	12	Change “instant” to “incident”
265	13	Change “mediate” to “mitigate”
265	13	Change “consequence” to “consequences”
265	14	Change “and establish” to “that established”
265	23	Change “phases” to “basis”
266	9	Change “entire” to “cyber”
266	11	Change “for vulnerability” to “or vulnerabilities”
266	13	Change “established” to “cyber”
266	18	Change “on, and” to “on an”
266	19	Change “this” to “NIST”; Change “800-S-53” to “800-53”
266	19	Change “venders” to “standards”
266	25	Change “method” to “methods”
267	4	Change “affected” to “effective”
267	8	Change “NES” to “NIST”
267	11	Change “the” to “their”
267	12	Change “NARC” to “NERC”
267	13	Change “NARC’S” to “NERC’s”

Page	Line	Correction
267	14	Add “CIP” after “NERC”
267	15	Change “[unintelligible]” to “CSET tool,”
267	17	Change “bodies” to “parties”
267	18	Change “[unintelligible] assurance working group” to “Software Assurance Working Group”
267	20	Delete “it”
267	25	Change “So [unintelligible]” to “The Vogtle COL”
267	25	Change “subject to the” to “submitted its”
268	1	Change “the 10CFR 73054 [spelled phonetically]” to “10 CFR 73.54”
268	2	Change “REIs” to “RAIs”
268	3	Change “plant” to “plan”
268	7	Change “cellular” to “submitted”
268	8	Change “Vogtle” to “Vogtle’s”
268	11	Change “room” to “rule”
268	12	Change “[unintelligible]” to “Vogtle”
268	15	Change “collected” to “reflected”
268	19	Change “defensible” to “defensive”
268	20-21	Change “[unintelligible] layers” to “data diodes”
268	21	Change "layer" to "layers"
269	4	Change “the established” to “its cyber”
269	8	Change “established” to “cyber”
269	9	Delete “the”
269	13	Change “deviation” to “deviations”
269	16	Change “plant” to “plan”
269	19	Change “six months after Vogtle’s plan” to “systems at the Vogtle plant”
269	22	Change “center” to “centers”
269	23	Change “39-8 [unintelligible]” to “13.8”; Delete “attached”
269	24	Change “come” to “turn”
270	8	Change “these presentations” to “this presentation”
270	14	Change “instructional analysis for” to “structural analysis of”
270	17	Change “audit” to “audits”
270	21	Change “from” to “of”
271	7	Change “full core also” to “fuel core offload”
272	13	Change “[unintelligible]” to “SNC”
272	13	Change “details behind” to “detailed design of”
272	25	Change “REIs” to “RAIs”
273	6,10	Change “SSDs” to “SSCs”
273	11	Change “carrying” to “carry”
273	11	Change “it” to “them”
273	13,15	Change “SSDs” to “SSCs”
273	14	Delete “of”
273	19	Change “REI” to “RAI”
273	22	Change “not” to “no”
273	23	Add “the” after “that”
274	5	Change “interesting” to “interest”; Change “for” to “of”
274	7	Change “plank” to “plant”
274	10	Change “provides” to “revised”

Page	Line	Correction
274	16	Change “affluent” to “effluent”
275	3	Change “Vogtle’s” to “Vogtle”
275	11	Change “rebounding” to “or bounding”
275	15	Change “does” to “dose”
275	15	Change “milligrams” to “millirem” (Two instances)
275	17	Change “to restricted” to “and restricted”
276	5	Change “at” to “of”
276	9	Change “stride of” to “startup”
276	9	Change “that are in” to “during”
276	10	Change “extension” to “ascension”
276	11	Change “or first pre-plant” to “or first-three plant”
276	22	Change “low” to “blow”
276	24	Change “on” to “of”
277	8	Change “for emergency planning.” to “for the emergency plan.”
277	24	Change “but” to “that”
278	2	Change “available to us yet.” to “available yet.”
278	7-8	Change “part of the district” to “Part 50”
278	9	Change "5047" to "50.47"
278	13	Add “a” after “from”
278	13-14	Change “emergency [unintelligible]” to “emergencies at the plant.”
278	17	Change "5047" to "50.47"
278	19-20	Change “That’s why they” to “But that’s why we”
278	21	Delete “the”
278	25	Change "52-" to "52 --"; delete "20-"; change "5279" to 52.79"
279	4	Add “at that time” after “them”
279	11	Change “here” to “again”
279	17	Change “is tremendous” to “is a tremendous”
280	8	Change “BRUCE MUSICO” to “WESLEY SPARKMAN”
280	10	Change “from” to “of”
280	16	Change “Pierce” to “Pierce, Southern Nuclear”
280	21	Change "Metanic" to "Metamic"
280	25	Change “respect that” to “respect to that”
281	4	Change “them” to “it”
281	15	"Change "characterize" to "characterizes"
281	18	Delete "relate"
281	21	Delete "out"
281	24	Change "[unintelligible]" to "and eliminate the need to"
282	5	Change “four” to “all”
282	6	Change “[unintelligible] address the [unintelligible]” to “currently known address the currently known”
282	7	Change “[unintelligible] the answers” to “be used by the adversaries”
282	8	Change “part of [unintelligibile]” to “part of philosophy that”
282	9	Change “the [unintelligible]” to “it applies to all”
282	13	Delete "not"
282	22	Insert "a" between "have" and "very"
282	25	Change “[unintelligible]” to “Chief vendor of inspections”
283	1	Add “Office of New” before “reactors”
283	2	Delete "[spelled phonetically]"

Page	Line	Correction
283	3	Change “[unintelligible]” to “tests”
283	5	Change “[unintelligible]” to “tests in the”
283	6	Change “[unintelligible]” to “at the actual test site”
283	7	Change “[inaudible]” to “at the time”
283	10	Change "plan" to "plant"
283	17	Change "change" to "changed"
283	19	Change “DSD” to “TSC”
283	23	Change “as building” to “as the building”
284	1	Change “the support” to “those support”
284	15	Change “[unintelligible]” to “digital”
284	16	Change “over” to “in”
284	16	Change “south” to “cyber”
284	16	Change “plant” to “plans”
284	17	Change “have a” to “submit cyber”
284	17	Change “that” to “cyber”
284	18	Change “that incrementing [unintelligible]” to ‘they are implementing their cyber”
284	19	Change “[unintelligible]” to “high assurance that critical digital”
284	19	Delete “our”
284	20	Change “federal tax” to “cyber attacks”
284	20	Change “[unintelligible]” to “let me read actually – additionally"
284	21	Add “the cyber security” before “regulations”
284	24	Change “[unintelligible]” to “part of the cyber”
284	24	Change “NRC security” to “NRC’s periodic”
284	25	Add “not” after “plan it is”
285	4	Change “security” to “during”
285	5	Add “criteria” after “those”
285	7	Change "ERLINGER" to "ERLANGER"
285	8	Change “Southern Nuclear Operating Company” to “staff of the Nuclear Regulatory Commission”
285	9	Change "having been first duly sworn" to "having been previously duly sworn"
285	11	Change "ERLINGER" to "ERLANGER"
285	11	Change "Erlinger" to "Erlanger"
285	12	Change “grants” to “branch”
285	12-13	Delete “[spelled phonetically]”
285	15	Change “the support” to “is important to”
285	18	Change “[unintelligible]” to “thought of”
285	18	Add “eventually” after “applicant”
285	19	Change “this” to “its” (two instances)
285	20	Change “an” to “it in”
285	23	Insert “in” after “mentioned”
286	3	Change "Erlinger" to "Erlanger"
286	3	Insert “of the” after “all”
286	4	Change ‘[inaudible]” to “plan”
286	6	Change "than" to "and"
286	9	Delete "[spelled phonetically]"
286	12	Change "ERLINGER" to "ERLANGER"
286	12	Change "Erlinger" to "Erlanger"

Page	Line	Correction
286	13	Change “follow” to “fall to”
286	14	Change “[unintelligible]” to “that in the”
286	21	Change “TSA the” to “TSC with”
286	22	Change “lot” to “a lot”
286	22	Insert “a” after “state,”
286	24	Change “- - look at” to “for the”
287	6	Change "ERLINGER" to "ERLANGER"
287	8	Change “and” to “at”
287	10	Change “my directional” to “bidirectional”
287	18	Change “by regulation” to “by a regulation”
287	23	Change “We” to “But, we”
287	24	Change “the cyber security to protect [unintelligible]” to “a cyber security attack vector”
288	7	Change "7354" to "73.54"
288	8	Change "A1" to "(a) (1)"
288	10	Change "[inaudible]" to "emergency prepareness"
288	11	Delete "what this really then [unintelligible] the whole"
288	12	Delete "thing --"
289	1	Change "ERLINGER" to "ERLANGER"
289	13	Change "inside the" to "and cyber"
289	15	Change "ERLINGER" to "ERLANGER"
289	17	Change “7354” to “73.54 and”
289	23	Delete "[inaudible], showing me six minute [inaudible]"
289	25	Delete "test"
290	1	Change “Appendix c [spelled phonetically]” to “Appendix E”
290	1	Insert "exercise" before "within" and insert "to" between "prior" and "fuel"
290	2	Delete "[inaudible]"
290	9	Change “[unintelligible]” to “fleet”
290	10	Change “and we find” to “ahead, we plan”
290	11	Change “have those” to “have to have those”
290	15	Change "[unintelligible] to "emergency planning"
290	16	Delete "[inaudible]"
290	18	Change “THEODORE AMUNDSON” to “BRUCE MUSICO”
290	20	Change "a [inaudible]" to "an emergency planning"
291	3	Change “sever” to “severe”
291	6	Change “THEODORE AMUNDSON” to “BRUCE MUSICO”
291	6	Change “during ESP” to “during the ESP”
291	7	Change “ASOB” to “ASLB”
291	8	Change “TSD” to “the TSC”
291	9	Change “those now” to “the personnel”
291	10	Change “state evaluation report” to “Safety Evaluation Report”
291	13	Change “THEODORE AMUNDSON” TO “BRUCE MUSICO”
291	18	Change "sort" to "start"
291	21	Change "[unintelligible]" to "significant" and insert "in" before "those"
291	22	Insert “Not” before “that”
291	23	Change “MALE SPEAKER” to “BRUCE MUSICO”
292	3, 16	Change “MALE SPEAKER” to “BRUCE MUSICO”

Page	Line	Correction
292	5	Insert “was” after “One”
292	6	change “emergency plan” to “emergency planning”
292	13	Change "[unintelligible]" to "focus on the"; change "[inaudible]" to "in the Vogtle"; and change "so" to "that"
292	14	Insert "in" after "Anything"
292	15	Change "[inaudible]" to "reactors"
292	16	Change “offset” to “off-site”
292	17	Change “on” to “off”
292	24	Change "condition" to "question"
293	6	Change "having been first duly sworn" to "having been previously duly sworn"
293	9	Change “demand” to “design”
293	10	Insert “fleet” after “existing”
293	10	Add “of the facility” after “basis”
293	11	Add “specifically” after “actually”
293	12	Change “clarify” to “verify”
293	13	Change “phenomenon” to “phenomena”
293	18	Change “exclusively” to “explicitly no”
293	19	Change ”[unintelligible]” to “passive core cooling”
293	19	Change “of” to “at”
294	1	Change "son" to "on"
294	2	Change "of inert" to "with NERC"
294	3	Insert "the" after "between"; delete the period after "interface"; and make the "t" in "Typically" lowercase
294	4	Delete the period and insert "and" after "interface"; make the "d" in "Discussion" lowercase; change "right" to "bright"; and delete the commas after "line" and "surveys"
294	6	Insert "with" after the comma after "have" and change "global" to "proposed"
294	7	Delete the comma and insert "between" after "boundary"
294	8	Change “already” to “wrote a”
294	8	Add “paper” after “SECY”
294	9	Change “you did for unit” to “in”
294	9	Change “associate” to “associated”
294	11-12	Change line 11-12 to “we have provided that information to the Vogtle and they have implemented their -- revised to reflect the changes into their Vogtle plan.”
294	17	Change “NERK” to “NERC"
294	24	Change “clinical” to “critical”
294	25	Change “and would” to “that would”
295	23	Change “UF” to “EOF”
296	1	Change “for example” to “for an example”
296	3	Change “events” to “units”
296	4	Change “any dent in” to “an event at”
296	8	Change “We’re” to “If”
296	10	Change “so we” to “so that we”
297	9	Delete “DALE FULTON”
297	10	Delete “AMY AUGHTMAN”
297	11	Delete “CHUCK PIERCE”

Page	Line	Correction
297	12	Change "was called as a witness" to "were called as witnesses"
297	12	Change “Southern Nuclear Operating Company” to “the staff of the Nuclear Regulatory Commission”
297	13	Change "having been first duly sworn" to "having been previously duly sworn"
297	13	Change "was" to "were"
297	21	After line 21 add: CHAIRMAN JACZKO: Great. Now from the Applicant Add: “WHEREUPON, DALE FULTON, AMY AUGHTMAN, CHUCK PIERCE were called as witnesses for the Southern Nuclear Operating Company and, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:”
298	5	Delete "[unintelligible]"
298	9	Change “efforts,” to “efforts and”
298	14	Change “associates” to “associated”
298	15	Change “coded” to “covered”
298	15	Change “LWA,” to “LWA, and”
298	17	Change “limit to” to “limited”
298	21	Change “incident in” to “and significant”
299	8	Change “Vogel” to “Vogtle”
299	14	Change “work root” to “water proof”
299	19	Change “out the” to “out that the”
300	1	Change “high land” to “island”
300	6	Change “[unintelligible]” to “for permanent”
300	15,21	Change “poppy” to “pocket”
300	15,23	Change “sand hills mill patch” to “sandhills milk vetch”
300	18	Change “impacts to” to “impacts of”
300	19	Change “Sothern” to “Southern”
300	22	Change “condition” to “construction”
301	3	Change “environment” to “environmental”
301	5	Change “I, II” to “I and II”
301	7	Change “findings” to “impact”
301	10	Change “with” to “which”
301	11	Change “Sothern’s” to “Southern’s”
301	12	Change “environment” to “environmental”
301	12	Change “to staff” to “the staff’s”
301	17,24,25	Change “limit to” to “limited”
301	19	Change “regulations” to “regulation”
301	24	Change “addition” to “addition,”
302	1	Change “limit to” to “limited”
302	1	Change “authorization” to “authorizations”
302	10	Change “from” to “for”
302	10	Delete “be”
302	11	Change “stabilized” to “destabilize”
302	20	Change “as” to “As”
302	21	Change “to environmental” to “the environmental”
302	25	Change “not have” to “have not”
303	4	Change “Sothern’s” to “Southern’s”
303	8	Change “Vogel” to “Vogtle”

Page	Line	Correction
303	13	Change “Southern Nuclear Operating Company” to “the Nuclear Regulatory Commission”
303	13	Change “Southern Nuclear Operating Company” to “NRC Staff”
303	14	Change "having been first duly sworn" to "having been previously duly sworn"
303	17	Change “Here” to “And”
303	18	Change “Vogtle 3 and 4” to “Vogtle Units 3 and 4”
303	19	Change “applications” to “application”
303	24	Delete “and”
303	25	Change “[unintelligible]” to “Endangered Species”
304	3	Change “testing” to “assessments”
304	5	Change “on” to “under”
304	5-6	Change “except for the agency’s regulation transferred for Part 51” to “as set forth in the agency’s regulation 10 CFR Part 51”
304	7-8	Change “was outlined for the Commission. The adequacy” to “will outline for the Commission the adequacy”
304	9	Change “issuance, the request to combine license” to “issuance of the requested combined license”
304	12	Change “represents” to “references”
304	13	Change “known as ESP. It’s” to “known as an ESP is”
304	13	Change “view” to “review”
304	17	Change “[unintelligible]” to “a COL”
304	20	Change “and CIM” to “FEIS”
304	21	Change “and CIM” to “FEIS”
304	24	Change “applicant’s” to “the applicant’s”
304	24-25	Change “to find” to “for identifying”
305	2	Change “conclusion” to “conclusions”
305	3	Change “FEIS” to “SEIS”
305	5	Change “social methods but is now determined by additional analysis of new information, [unintelligible].” to “circumstances where the staff determined that additional analysis of new information was appropriate.”
305	8	Change “ESP conclusions” to “ESP stage conclusions”
305	10	Change “conclusions” to “conclusion”
305	11-12	Change “Sothern’s [unintelligible] prior amendment in” to “Southern’s requests for amendments to”
305	14	Change “As [unintelligible] client explained,” to “As described previously,”
305	15	Change “was” to “which was”
305	16-17	Change “[unintelligible] for the regulation, therefore 5175” to “Title 10 of the Code of Federal Regulations CFR 51.75”
305	18	Change “EIM” to “EIS”
305	18	Change “10CFR 5192E” to “10 CFR 51.92(e)”
305	20	Change “construction, operation” to “construction and operation”
305	23-24	Change “of 5192, [unintelligible] COL review [unintelligible] threat” to “in 51.92 direct the COL review to address”
305	25	Change “as” to “and to”
305	25	Change “focused” to “focus”
305	25	Change “there’s” to “there is”

Page	Line	Correction
306	4	Change “an essential” to “the central”
306	6	Change “will require” to “were required”
306	6	Change “and EIF” to “SEIS”
306	7	Change “to be considered” to “reconsidered”
306	7	Change “NRC” to “NRC’s”
306	8	Change “and EIS” to “FEIS”
306	8	Change “—so first we” to “appropriately”
306	11	Change “references ESP” to “references an ESP”
306	12	Change “other ESP“ to "other ESPs"
306	15	Change “about the ESP” to “of other ESPs”
306	16	Change "followed“ to "following“
306	19	Change “socio-economic” to “socioeconomics”
306	22	Change "on past“ to "from past“
306	24	Change “[unintelligible] to” to “including”
307	2	Change “optional.” to “optional for the ESP stage.”
307	2	Change "And as the applicant“ to "An ESP applicant“
307	5	Change “[unintelligible]” to “subjects”
307	6	Change “then” to “them”
307	10	Change “[unintelligible]” to “of basing its”
307	11	Change “[unintelligible]” to “range of”
307	13	Change “[inaudible]” to “Which the NRC had already certified.”
307	13	Change “afforded” to “avoided”
307	13	Change “impact” to “impacts”
307	14	Change “[unintelligible]” to “with less”
307	14	Change “design” to “designs”
307	14	Change “saw” to “Southern”
307	15	Change “until” to “its COL”
307	15	Change “with” to “would”
307	15	Change “[unintelligible]” to “the amended”
307	18	Change “will” to “would”
307	19	Change “[unintelligible]” to “ESP”
307	20	Change “FDIS” to “FEIS”
307	21	Change “has” to “had no”
307	23	Change “close in time to the EFC [unintelligible]” to “closely in time to the ESP the COL”
307	24	Change “ESP [unintelligible]” to “ESPs are valid for”
307	25	Change “[unintelligible]” to “COL”
308	2	Change “was underway” to “was still underway”
308	2	Change “EIS” to “FEIS”
308	3	Change “the applications” to “its applications”
308	8	Change “into” to “and COL”
308	8	Change “[unintelligible]” to “tier off”
308	9	Change “[unintelligible]” to “final”
308	9	Change “streamline” to “streamlined”
308	10	Change “[inaudible]” to “supplement”
308	13	Change “and EIS” to “FEIS”
308	15	Change “conclusion” to “conclusions”
308	15	Change “SEIS” to “FEIS”
308	15	Change “SCIS” to “SEIS”

Page	Line	Correction
308	16	Change “[unintelligible] the ESP [unintelligible] the” to “tiered off the ESP final”
308	18	Change “significant [unintelligible] definition” to “significance level definitions”
308	19	Change “impact” to “impacts”
308	22	Change “[unintelligible]” to “or to destabilize”
308	24	Change “impact” to “impacts”
309	1	Change “socio-economic” to “socioeconomics”
309	1	Change “its” to “the”
309	2	Change “[unintelligible]” to “historic and cultural”
309	2	Change “its” to “that”
309	3	Change “will be moderate” to “would be moderate”
309	3	Change “EIS explains” to “EIS analysis explains”
309	3-4	Change “will only be [unintelligible] will be mitigated” to “would only be temporary or would be mitigated”
309	6	Change “staff” to “staff’s
309	8	Change “partially accident [spelled phonetically]” to “postulated accidents”
309	13	Delete “[spelled phonetically]”
309	13	Change “to be” to “would be”
309	14-15	Change “licensee compliance of federal and state require permits and certification for the minimized and impact” to “licensee’s compliance with federal and state required permits and certifications would minimize any impacts”
309	18	Change “of [unintelligible]” to “to terrestrial”
309	18	Change “will be” to “would be”
309	19	Change “[unintelligible]” to “terrestrial”
309	20	Change “included the applicant’s [unintelligible]” to “including the applicant’s best”
309	22-23	Change “dependent on [unintelligible] transmission line route [unintelligible] the right upgrades would be moderate” to “depending on the final transmission line route, terrestrial ecology impacts within the right-of-way could be moderate.”
310	1-2	Change “[unintelligible], especially in [unintelligible]” to “adverse, especially in Burke”
310	5	Change “[unintelligible]” to “transmission”
310	6	Change “And the traffic impact [unintelligible] in site” to “as could traffic impacts on roads in the site”
310	7	Change “impact” to “effect”
310	8	Change “[unintelligible]” to “receipts in Burke”
310	13	Change “[unintelligible]” to “deposits”
310	14	Change “At [unintelligible] ESP” to “As explained in the ESP”
310	14	Change “are” to “were”
310	15-16	Change “litigation measures to indentify and” to “mitigation measures were identified to”
310	17	Change “SEIS” to “FEIS”
310	19	Change “agrees” to “agreed”
310	23	Change “[unintelligible]” to “obviously superior”
311	1	Change “was saying” to “explained”

Page	Line	Correction
311	1	Change “that ESP SEIS” to “the ESP FEIS”
311	2-3	Change “follows the structure of the ESP SEIS for the review prominently spoken on needs as soon as we get information” to “followed the structure of the ESP FEIS, but with the review process focused on new and significant information”
311	6	Add “I led” after “application”
311	8	Add “particular” before “technical”
311	12	Change “to find” to “in preparing”
311	12	Change “license and” to “licensing”
311	13	Change “especially” to “such as”
311	13	Change “ESP and COL” to “ESPs and COLs”
311	14	Add “were” before “also”
311	15	Change “[unintelligible] specific” to “leverage this”
311	16-17	Change “[unintelligible] 10CFR section 192 [spelled phonetically] the staff [unintelligible] environmental review focus” to “Pursuant to 10 CFR 51.92 the staff’s COL environmental review focused”
311	16-25	Replace lines 16-25 with “Pursuant to 10 CFR 51.92 the staff’s COL environmental review focused on whether there was new and significant information. As previously discussed, the NRC is required to prepare a supplemental environmental impact statement as part of its review of a COL application referencing an ESP. The NRC staff tiers off the ESP EIS at the COL stage and discloses the NRC conclusion for matters resolved in the ESP review. Detailed procedures for conducting the environmental portion of the review are found in NUREG-1555, the Environmental Standard Review Plan, or ESRP, which is the Staff’s principal guidance document for conducting environmental reviews.”
312	1-5	Replace lines 1-5 with “As I will explain, the staff’s review drew on staff guidance, information gathered during several site audits, the staff’s evaluation of the applicant’s process for identifying new and significant information obtained by the applicant through requests for additional information, interactions with the public and with other governmental agencies, and the staff’s independent analysis.”
312	7-8	Change “in [unintelligible]” to “and comment”
312	8	Change “amendment” to “amendments”
312	9	Change “license certifications approvals of nuclear power plant” to “licenses, certifications, and approvals for nuclear power plants”
312	10	Change “reference and ESP. [unintelligible]” to “referencing an ESP and aids the”
312	14	Change “must [unintelligible]” to “must -- it is defined as”
312	18	Change “SEIS” to “FEIS”
312	21	Change “[unintelligible]” to “may develop”
312	22	Change “conclusion” to “conclusions”
312	22	Change “to come away with” to “to become aware of”
312	24	Change “applicants” to “applicant”
312	25	Change “environmental [unintelligible], scientific literature, and [unintelligible]” to “environmental monitoring results, scientific literature, and surveying”

Page	Line	Correction
313	1	Change “this type of facility” to “the site vicinity”
313	2-3	Change “assumption and representation made in the ESP ER and ESP EIS are still [inaudible]” to “assumptions and representations made in the ESP ER and ESP EIS are still valid”
313	4	Change “[unintelligible]” to “guidance”
313	5	Change “[unintelligible] for the Vogtle [unintelligible]” to “for the Vogtle COL”
313	6	Change “consists” to “consisted”
313	7	Change “evaluated” to “evaluating”
313	8	Change “staff” to “staff’s”
313	8-9	Change “As requirement 10CFR 5150c1 [unintelligible] referenced in any” to “As required by 10 CFR 51.50(c)(1), a COL applicant referencing an”
313	11	Change “[unintelligible] still the” to “tendered its COL”
313	13	Change “[unintelligible]” to “its COL”
313	13	Change “which” to “was”
313	14	Change “uses” to “used a”
313	15	Add “the” before “applicant’s”
313	16	Change “on” to “in the”
313	20	Change “issue” to “issuance”
313	21	Change “has now” to “the staff”
313	21-22	Delete "[spelled phonetically]"
313	25	Replace line 25 with “The site audits also included several site tours, including”
314	1-3	Replace lines 1-3 with “a tour of the potential transmission line rights-of-way, and the location of the intake structure on the Savannah River, and the locations of cultural and historic resources.”
314	4-9	Replace lines 4-9 with “The Staff also conducted a separate environmental audit associated with the applicant’s requests to amend its ESP and LWA in May 2010, which included use of additional fill material from borrow areas that were not considered in the ESP FEIS. These requests were ultimately addressed in three separate amendments to the ESP and LWA, and for which the staff prepared Environmental Assessments.”
314	11	Change “departments” to “developments”
314	12	Change “[unintelligible]” to “for the COL”
314	14	Change “education of the applicant’s [unintelligible]” to “verification that the applicant did follow its”
314	19	Change “request” to “requests for”
314	20	Change “[unintelligible]” to “conducted its own”
314	25	Change “[unintelligible]” to “applicable”
315	1-5	Change lines 1-5 to “staff contacted the State of Georgia Historic Preservation Officer (SHPO), Georgia Department of Natural Resources, South Carolina Department of Natural Resources, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, National Marine Fisheries and approximately 30 Federally-recognized Indian Tribes in order to gather relevant information.”

Page	Line	Correction
315	6-8	Change “As an example, the staff received a response letter from special [unintelligible] service, indicating that the list of threatened or endangered species are [unintelligible] adequately addressed” to “As an example, the staff received a response letter from the Fish and Wildlife Service indicating that the listed threatened or endangered species under that agency’s purview had been adequately addressed”
315	10	Change “staff [unintelligible]” to “staff’s consideration of”
315	10	Change “Appendix C” to “Appendix E”
315	13	Change “[unintelligible] 5192E” to “10 CFR 51.92(e)”
315	14	Change “a way of development in NRC [unintelligible]” to “aware of developments in the NRC staff’s parallel”
315	15	Delete “that”
315	16	Change “change of associates” to “changes associated”
315	18-19	Change “a potential to change the impact conclusions in the EIS” to “the potential to change its impact conclusions in the FEIS or SEIS”
315	20	Change “effective [unintelligible] of the SEIS” to “effective tiering off of the FEIS”
315	22	Change “a early site from the” to “the Early Site Permit”
315	23	Change “[unintelligible] with the” to “and evaluated”
315	24	Change “we” to “it”
316	3	Change “at EIS” to “FEIS”
316	6-7	Change “effective area acreage” to “affected acreage”
316	7	Change “279” to “379”
316	8	Change “fire trained [spelled phonetically] facility and a simulator building” to “fire training facility and the simulator building”
316	10	Change “[unintelligible] impact film [spelled phonetically]” to “for obtaining backfill”
316	13	Delete “[spelled phonetically]”
316	14	Change “planning” to “plan”
316	14	Change “In respect to mineralogy and air quality” to “With respect to meteorology and air quality”
316	16-17	Change “are provided in refined estimates on” to “and provided a refined estimate of”
316	20	Change “were made” to “remained”
317	5	Change “SEIS” to “FEIS”
317	6	Change “[unintelligible]“ to “borrow”
317	7	Change “background” to “backfill”
317	8	Change “[unintelligible]” to “borrow areas”
317	9	Change “this” to “its”
317	11	Change “bowl” to “borrow”
317	13	Change “need to intercept the water table now requiring dewatering” to “neither intersect the water table nor require dewatering”
317	15	Change “bowl” to “borrow”
317	15	Change “which was used to the core mix model” to “which used the CORMIX model”
317	22	Change “SEIS” to “FEIS”

Page	Line	Correction
317	23	Change “reran the CORMIX” to “re-ran the CORMIX”
318	7	Change “[unintelligible]” to “rule”
318	8	Change “[unintelligible]” to “and South Atlantic”
318	10	Add “determined” after “staff”
318	13	Change “distant” to “listing”
318	14	Change “conservation” to “consultation”
319	*passim*	Change “shiphold” to “SHPO”
319	3	Change “from the” to “from both”
319	4	Change “coastal” to “cultural”
319	5	Change “area potential effect” to “area of potential effects”
319	6	Change “affect” to “effects”
319	8	Delete “[spelled phonetically]”
319	13	Add “of” after “memorandum”
319	17	Change “SFESS” to “FSEIS”
319	19	Delete “[spelled phonetically]”
319	23	Change “10.04.5192” to “10 CFR 51.92”
320	7	Change “admittable” to “available”
320	9	Change “activate” to “reactivate”
320	11	Change “[unintelligible]” to “tailoring”
320	24	Change “10CFR 5010D” to “10 CFR 50.10(d)”
321	3-4	Change “would [unintelligible]” to “were later withdrawn”
321	5	Change “impact” to “impacts”
321	8	Change “SEIS” to “FEIS”
321	15	Change "redressed in" to "redressed is"
321	15	Change “bounded” to “bounding”
321	16	Change “SEIS” to “FEIS”
321	18	Change “support” to “supports”
321	20	Change “at in store” to “and install”
321	21	Change “bowl” to “borrow”
321	22-23	Change “for slopes used in three and four excavations” to “over the slopes of Units 3 and 4 excavations”
321	25	Change “moved” to “need”
322	*passim*	Change “bowl” to “borrow”
322	9	Change “application” to “classification”
322	10	Change “those” to “proposed”
322	10-11	Change “The system with [unintelligible]” to “Consistent with NEPA”
322	12	Change “SEIS” to “FSEIS”
322	13	Change “I referenced” to “by reference”
322	16-17	Change “impact off site footprint” to “impacts outside the footprint”
322	17-18	Change “a sandhill mill patch in” to “sandhills milkvetch, a”
322	25	Change “Sandhill's Mill Patch” to “sandhills milkvetch”
323	7	Change “So it” to “Southern”
323	8-9	Change “not only the kind of fundamental component of Sandhill's habitat in the burrow” to “longleaf pine, a fundamental component of sandhills habitat, in the borrow”
323	11	Change “bowl” to “borrow”
323	13	Delete "[spelled phonetically]"

Page	Line	Correction
323	14	Change “Sandhill's Mill Patch” to “sandhills milkvetch”
323	18	Change “I referenced” to “by reference”
323	22-23	Change “confirmed to the guidance of line” to “conformed to the guidance outlined”
323	24	Change “included” to “including”
324	4	Change “took by additional backfill change” to “to acquire additional backfill changed”
324	4	Change “SEIS” to “FEIS”
324	8	Change “verbal” to “Vogtle”
324	10	Change “and” to “that it”
324	12	Change “it” to “and”
324	13	Change “water disciplinary” to “multidisciplinary”
324	13	Change “licensed” to “licensing”
324	22	Change “SEIS” to “FEIS”
324	24	Change "during" to "they're in"
325	5	Change “actions” to “action”
325	22	Change “an” to “the”
325	25	Change “Ms.” to “Mr.”
326	9	Change “straining, a” to “screening. In our”
326	10	Change “strain” to “screening”
327	14	Add “related” after “concerns”
328	13	Change “a design based” to “design basis”
329	2	Delete “you”
329	4	Change “not the” to “not a”
329	5	Change “considered” to “consider”
330	3	Insert a period after "presentations"; delete "in"
330	4	Delete "that" and captialize the "T" in "the staff"
330	12	Change "because" to "but"
330	15	Change “applicant [unintelligible]” to “applicant’s new and significant”
330	18	Change “[unintelligible]” to “because that is a staff”
330	20	Add "do" after "could"
330	25	Change “[unintelligible]” to “things”
331	7	Change “[unintelligible]” to “on the docket”
331	7	Change “when we did the” to “went ahead and did a”
331	8	Change “time” to “site”
331	9	Change “[unintelligible] we also had [unintelligible]” to “we also had Georgia Department of Natural”
331	12	Change “Sanhill Mill Patch” to “sandhills milkvetch”
331	21	Change “[unintelligible]” to “analysis”
331	22	Change “FCIN” to “ESP EIS”
331	22-23	Change “So, we kept those contacts [unintelligible]” to “So, we kept close contact with our safety counterpart to ensure that was the case”
332	8	Change "reference" to "referenced"
332	16	Change “the original” to “leveraging the”
332	20	Change “pocket [spelled phonetically] two” to “part 52”

Page	Line	Correction
332	21-22	Change “[unintelligible], the areas of, you then -- let me use a [unintelligible] as well, with also unique features” to “I said -- but there is -- the areas of -- using -- not using a plant parameter envelope as well, was also a unique feature”
332	24	Change “after” to “in this”
333	2	Add a comma after "effort" and make the "i" in "It" lowercase
333	5	Delete “two”
333	12	Change "reduce [spelled" to "release"
333	13	Delete "phonetically]"; change "radio activity." to "radioactivity."
333	14	Change "[unintelligible]" to "review of"
333	16	Delete “four”
333	17	Change “that’s what” to “for the”
333	19	Change "regional" to "original"
333	20	Change "or" to "for"
334	3	Change "[unintelligible]" to "happened"
334	10	Replace line 10 with “It’s separated that way.”
334	14	Change "[unintelligible] to "the result"
334	24	Change “[unintelligible]” to “stating”
335	14	Change “Male Speaker” to “Robert Schaaf”
335	20	Change “a [unintelligible] reaction” to “our severe accident”
336	14	Change “Mr.” to “Commissioner”
336	17	Change “[unintelligible]” to “external”
337	16	Change "like it was" to "like if there was"
337	17	Change "[unintelligible]" to "the only thing" and change "of" to "would be"
337	23	Change "EIS" to Environmental Impact Statements" and change the last "the" to "these"
337	24	Replace the comma after "do" with "-- " and change "I thought more" with I thought they would be more"
337	25	Delete "a lot of"
338	1	Change "work" to "analysis"
338	4	Delete "One more," and capitalize the "y" in "you"
338	5	Change "thought this." to "thought that."
338	6	Delete "-- didn't relay in"; change "that came from PPO." to "didn't rely on a PPE."; and change the comma after "envelope" to a period
338	7	Capitalize the "h" in "how"
338	8	Change "they used to PPT [spelled phonetically]" to "they used a PPE" and delete "that"
338	9	Change [inaudible]" to "how it would have impacted your analysis"
338	10	Add “North Anna” after “Well,”
338	11	Change “PSPPIN” to “ESP EIS”
338	13	Change “[unintelligible] potential” to “North Anna is quite substantial”
338	13-14	Change “it's [unintelligible]” to “it does cut down on the bulk”
338	14	Change “different” to “deferred”
338	21	Change “primer” to “parameter”
339	1	Change “primer” to “parameter”
339	3	Change “[inaudible]” to “the staff has to do.”

Page	Line	Correction
339	8	Change "[unintelligible]" to "unfair" and insert "to" before "pick out"
339	9	Delete "and if you don't"
339	15	Change “I’d like to respond to that” to “I’ve got the response”
339	16	Change “As a part [unintelligible] of the staff, you see some” to “At the public meeting, the staff did receive some”
339	17	Delete "[spelled phonetically]"
339	17	Change “[unintelligible]” to “probably Rich Emch”
339	18	Change “and so when they communicated” to “there was indicated”
339	23	Change "[unintelligible]" to "to increased incidence of"
339	25	Change “[inaudible]” to “plants”
340	6	Delete "journal, I just wanted to ask though, I was"
340	7	Change "reading" to "question"
340	11	Change "effect of" to "affected"
340	12	Insert "a practice of" after "Is there" and change comma after "people" to a question mark; and capitalize the "h" in "how"
340	14	Delete “of”
340	15	Change “Vogtle” to “local”
340	16	Change “[unintelligible] asks if” to “try to ask them if they know of”
340	17	Change “SEIS” to “FSEIS”
340	18	Change “need” to “needed”
340	19-20	Change “the NCIS and the supplements remained [unintelligible]” to “the ESP EIS and the supplement remained bounded”
340	23	Delete "[spelled phonetically]"
340	25	Change “about four counties” to “no four counties”
341	9	Change “[inaudible]” to “supplement”
341	14	Change "environmental representation agency" to "Environmental Protection Agency"
341	15	Change "the ESP IS" to "on the FEIS"
341	17	Delete the comma after "comment"
341	18	Change "legislative documents," to "comments and were there"
341	20	Change “SEIS” to “FSEIS”
341	20	Change “application in” to “clarification”
341	20-21	Change “that that big update was not mentioned, that that information with any documentation” to “the staff did update the documents to reflect that information within the documentation”
342	2	Change “carried out” to “tiered off”
342	8	Change “4.4 section, section 4.4” to “a 404, section 404”
342	11	Change “[unintelligible]” to “cumulative”
342	13	Change “portal” to “corridor”
342	13	Change “core” to “corps”
342	15	Change "supplement agreement" to "supplemental question"
342	17	Insert "not" between "would" and "distinguish"
343	1	Change “CQ [spelled phonetically]” to “CEQ”
343	6	Change “and to” to “and then”
343	8	Change “have” to “need”
343	10	Change "Is it at high level" to "At a high level"
343	12	Delete "and any" and change "[unintelligible]" to "differences"
343	17	Delete “[spelled phonetically]”

Page	Line	Correction
343	18	Change “information,” to “information and”
343	19	Change “for example” to “for an example”
343	21	Delete “in”
343	22	Change “they want” to “they’re going”
344	1	Change “ensure” to “ensure that”
344	3	Change “Where you said” to “From where you sit”
345	3	Delete "[spelled phonetically]"
345	6	Delete “CHUCK PIERCE”
345	9	Delete “BUZZ MILLER”
345	11	Change "was called as a witness" to "were called as witnesses"
345	11	Change “Southern Nuclear Operating Company” to “the Nuclear Regulatory Commission”
345	12	Change "having been first duly sworn" to "having been previously duly sworn"
345	12	Change "was" to "were"
345	14	Change “Shaw” to “Schaaf”
345	15	Change “safety and environmental reviews” to “Division of Site and Environmental Reviews”
345	18	Delete “Office”
345	19	Delete “of”
345	19	Change “Reactors” to “Reactor”
345	After line 19	Add “WHEREUPON, CHUCK PIERCE , BUZZ MILLER were called as witnesses for the Southern Nuclear Operating Company and, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:”
346	9	Change “hearings” to “hearing”
346	10	Change “will” to “would”
346	13	Change “licensing” to “License”
346	14	Change “application” to “Application”
346	14	Change “that and” to “that last night and”
346	14,15	Change “Southern Nuclear did start” to “Southern Nuclear, NuStart,”
346	15	Change “that extended” to “have expended”
346	16	Change “and support” to “and to support”
346	19	Change “readiness of” to “readiness to begin construction of”
346	19	Change “rebar, to” to “rebar. To”
347	1	Change “site” to “site.”
347	2	Change “several” to “Several”
347	5	Change “built and” to “built as”
347	6	Change “Shaw planning” to “Shaw in planning”
347	7	Change “ITAAC’s” to “ITAAC”
347	10	Change “COL [spelled phonetically]” to “cold”
347	12	Change “COL” to “cold”
347	14	Change “they’re requesting” to “there are approximately”
347	15	Change “plan” to “planned”
347	16	Change “May I” to “I’d like to”
347	18	Change “during” to “during the”
347	20	Change “crew” to “per month”
347	23	Change “in the” to “as”

Page	Line	Correction
348	2	Change “identified” to “identify”
348	8	Change “about the” to “about about the”
348	9	Change “SR” to “FSAR”
348	15	Change “specifics” to “specific”
348	16	Change “We” to “And we”
348	23	Change “mechanical” to “mechanically”
349	7	Change “inconsistency” to “inconsistencies”
349	13	Change “on” to “upon”
349	15	Change “applications” to “application”
350	2	Change “a number of compensations” to “limited work authorizations”
350	4	Change “application. Past” to “application – that the”
350	4	Change “inadequate” to “adequate”
350	12	Delete “le”
350	19	Change “with” to “of”
350	20	Add “the” before “Vogtle”
350	25	Change “in” to “and”
351	4	Change “staff statement have supported this” to “staff’s statement of support of this”
351	5 & 6	Change “10CFR” to “10 CFR”
351	6	Change “so affording” to “supporting”
351	8	Change “unsolved” to “unresolved”
351	11	Change “licenses” to “license”
351	21	Add “the” before “license”
351	24	Change “we” to “I would”
352	8	Change “an improved” to “and approved”
352	12	Change “conditional” to “Commission”
352	13	Change “in the” to “and any”
352	15	Change “this past” to “the staff’s”
353	9	Insert "not" between "is" and "a real"
355	1	Change “applications” to “activities”
355	5	Change “to recognize” to “directed by the”
355	6	Change “looking” to “moving”
355	9	Change “the actors” to “new reactors”
355	9	Change “and” to “in”
355	11	Change “designs that are” to “design cert if”
355	11	Change “appropriate to the COL” to “appropriate, to the COL”
355	12	Add “to” between “requirements,” and “adjust the license”
355	13	Change “where” to “we’re”
355	16	Change “MALE SPEAKER” to “BUZZ MILLER”
355	17	Change “fully” to “fleet”
355	20	Change “an” to “our”
356	5	Delete "to" after "ability"
356	8	Insert "later" after "it"
356	19	Insert "to" after "getting" and insert "of" after "milestone"
356	22	Change "subjugator rule" to "adjudicatory role"
357	1	Insert "what" after "could do"
357	5	Change "is" to "in"
357	6	Change "importance of the" to "important work that"

Page	Line	Correction
357	7	Delete "do you feel,"
357	14	Change “to” to “for”
357	16	Change “solve” to “resolve”
357	17	Change “in terms of” to “with respect to”
357	18	Change “processes” to “process”
357	18	Change “recommendation” to “implementation”
357	18	Add “program” between “ITAAC” and the period
357	21	Change "were" to "are"
357	22	Change "confidence" to "confident"
358	1	Change “date, the” to “date, on the”
358	5	Insert "a" after "and so"
358	14	Insert "the" after "objection to"; change "proposed change" to "proposed changed"
358	16	Change "so in may be" to "so it may be"
358	21	Change “that two” to “that in two”
358	22	After “for.” add on next line: “COMMISSIONER SVINICKI: Okay”
358	22	Add on next line: “CHUCK PIERCE: Having” and then resume Mr. Pierce’s statement as shown on lines 23-25.
358	24	Delete “could”
359	10	Insert "he" after "confident"
359	14	Change the comma to a period
359	21	Add a comma after "effort" and make the "t" in "The" lowercase
359	23	Change "ACRS's use" to "ACRS reviews"; change "address" to "addressed"
360	1	Add a comma after "licensing"
360	2	Add a comma after "kind" and change "combination" to "culmination"
360	7	Change "firsts" to "first"
360	10	Change "record the" to "record, but the"
363	18	Change "really give an assessment," to "give us an assessment,"

United States of America

Nuclear Regulatory Commission

+ + + + +

CORRECTED TRANSCRIPT

HEARING

IN THE MATTER OF DOCKET NO: 52-025-COL and

SOUTHERN NUCLEAR OPERATING COMPANY 52-026-COL

VOGTLE ELECTRIC GENERATING PLANT,

UNITS 3 AND 4

Tuesday,

September 27, 2011

+ + + + +

Rockville, Maryland

The hearing commenced in the Commissioners' conference room, 11555 Rockville Pike, Rockville, Maryland, at 9:00 a.m.

BEFORE:

Gregory B. Jaczko, Chairman

Kristine L. Svinicki, Commissioner

George Apostolakis, Commissioner

William D. Magwood, IV, Commissioner

William C. Ostendorff, Commissioner

APPEARANCES:

On Behalf of Southern Nuclear Operating Company:

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On Behalf of the United States Nuclear Regulatory Commission:

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Patrick Moulding, Esq.
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Rockville, Maryland 20852-2738

EXHIBITS:	MARK	ADMT	WITH	RJCT
Party: Southern Nuclear Operating Company				
Exhibit No.: SNC000002	17	17-18		
Exhibit No.: SNC000003	17	17-18		
Exhibit No.: SNC000004	17	17-18		
Exhibit No.: SNC000005	17	17-18		
Exhibit No.: SNC000006	17	17-18		
Exhibit No.: SNC000007	17	17-18		
Exhibit No.: SNCR00008	17	17-18		
Exhibit No.: SNC000009	17	17-18		
Exhibit No.: SNCR00010	17	17-18		
Exhibit No.: SNCR20001	17	17-18		

EXHIBITS:	MARK	ADMT	WITH	RJCT
Party: Nuclear Regulatory Commission				
EXHIBIT NO.: NRC1	18	18		
EXHIBIT NO.: NRC2	18	18		
EXHIBIT NO.: NRC3	18	18		
EXHIBIT NO.: NRC4	18	18		
EXHIBIT NO.: NRC5	18	18		
EXHIBIT NO.: NRC6	18	18		
EXHIBIT NO.: NRC7	18	18		
Subpart: A, B,C,D				
EXHIBIT NO.: NRC8	18	18		
Subpart A, B				
EXHIBIT NO.: NRC9	18	18		
EXHIBIT NO.: NRCR10	18	18		

EXHIBITS:	MARK	ADMT	WITH	RJCT
EXHIBIT NO.: NRCR11	18	18		
EXHIBIT NO.: NRCR12	18	18		
EXHIBIT NO.: NRCR13	18	18		
EXHIBIT NO.: NRCR14	18	18		

P-R-O-C-E-E-D-I-N-G-S

9:00 a.m.

CHAIRMAN JACZKO: Well good morning everyone and I think now that we can appropriately populate the table. Annette, are we repopulating the table now?

ANNETTE: Yes.

CHAIRMAN JACZKO: So whoever's supposed to come up.

ANNETTE: The staff and, I mean the applicant and staff counsel.

CHAIRMAN JACZKO: Well good morning everyone. I now call this hearing to order. We are here today to conduct a mandatory hearing as required by section 189 A of the Atomic Energy Act on Southern Nuclear Operating Company's application to build and operate two new reactors at the Vogtle site near Waynesboro, Georgia.

This hearing will address the Southern Company's application for two combined licenses and its related request for limited work authorization to conduct pre construction activities at the Vogtle site. The review of the new reactor license application is a substantial undertaking. It involves a host of complex, technical and legal questions in a broad range of important safety, security and environmental issues.

For the past several years the staff has been analyzing these issues so the Commission can make an informed and considered decision on this application. Today's mandatory hearing is one of the final steps in our licensing process before the Commission renders a decision on the

application. Everyone here at the NRC has approached this effort fully aware that this is among the most important safety decisions entrusted to the agency. The Commission's role in this hearing is to serve as an effective check on the staff's work. Before we can reach a decision on the application, we must carefully and thoroughly evaluate whether the staff's safety and environmental reviews have been adequate to support the necessary regulatory findings. Those findings are at the heart of our regulatory mission.

Our findings fall into two categories, safety and environmental. They include whether the staff's environmental analysis meets the requirements of the National Environmental Policy Act, whether the applicant has the necessary technical and financial resources and ultimately whether the facility will be constructed and operated safely and securely. Similar findings must also be made with regard to the applicants request for limited work authorization.

We have fully set forth the findings in the notice for today's hearing. This is an important and historic day at the NRC. This is the first mandatory hearing on a new reactor license application since the 1970s. This is also the first application to reach this final step under Part 52 licensing process which while established in the late 1980s has not been utilized until only recently. And this is the first time that the Commission itself, rather than licensing boards will conduct a mandatory hearing.

So I'd like to acknowledge the strong leadership of our predecessors in the Commission and of course the diligence of the NRC

staff in developing and implementing this new licensing process. The decision to assume the responsibility for conducting these mandatory hearings was not taken lightly. The Commission did so after a task force led by former Commissioner Jeff Merrifield recommended doing so. I fully supported the decision at the time and continue to believe that it was right because the Commission ultimately bears the responsibility of making this licensing decision.

I want to thank my colleagues for their efforts in preparing for this important hearing and to acknowledge the many NRC staff who have worked on this application. The Commission is committed to moving forward with this hearing and reaching a decision on this application in a thoughtful, timely manner that befits the important safety issues under review. So with that, I would offer my colleagues on the Commission to make any opening remarks. Commissioner Svinicki.

COMMISSIONER SVINICKI: Thank you, Mr. Chairman, you've really covered many of the points that I would make. So I will align myself with your comments about the history, the process, the purpose that we convene here today. And I was also going to note that I feel that I stand very much on the shoulders of previous Commissions and all of the staff's support that has built such a voluminous record that we will add to today, ultimately leading us to the objective of the important findings that we have to make. So thank you, Mr. Chairman.

CHAIRMAN JACZKO: Other comments? Okay. Well before we begin with the presentations, we have some formalities to take care of. So I will swear in the witnesses and formally admit the written

testimony and other exhibits into the record. Following that, we will turn to the presentations, starting with the applicant's overview panel. We expect the hearing to continue through tomorrow, although we will take a break to sleep tonight. After we have heard from all the panels, we will conclude with closing statements from both parties and final questions and concluding statements from each of the Commissioners.

Now let's start with the witnesses, both the staff and the applicants have provided their witness list in advance. The witnesses should please stand as their names are called and remain standing until we finish with the process. Counsel for the applicant will read his witness list first. Please clearly identify for the record any witnesses who are absent. Counsel, if you could begin.

STAN BLANTON: Good morning Mr. Chairman and Commissioners, I'm Stan Blanton. I'm counsel for the applicant. The applicant's witnesses are seated behind me and I'm going to read - call them in alphabetical order. Amy Greene Aughtman, Theodore E. Amundson, Dale L. Fulton, Eddie Grant, Richard Grumbir, Neil Haggerty, Joseph A. Miller, Donald P. Moore, Charles Pierce, Jerry G. Sims and Wesley Sparkman.

CHAIRMAN JACZKO: Okay, thank you. Now counsel for the staff, please read your list, clearly identifying for the record any witnesses that are absent.

ANN HODGDON: My name is Ann Hodgdon, Office of the General Counsel, Counsel for the NRC staff. The staff is presenting a total of 49 witnesses, including those for both the safety and environmental reviews. The staff witnesses are Michael Johnson, Frank Akstulewicz,

Ravindra Joshi, Denise McGovern, Larry Harris, Edward Roach, Duncan White, Barry Ray, Michael Dusaniwskyj, Seshagiri Rao Tammara, Brad Harvey, Jill Caverly, Weijun Wang, Bret Tegeler, Sarah Tabatabai, Thomas Scarbrough, Jennifer Dixon-Herrity, Kaihwa Robert Hsu, Eileen McKenna, Mohamed Shams, David Terao, Yi-Hsiung Hsii, John Segala, John McKirgan, Terry Jackson, Tania Martinez-Navedo, Om Chopra, Larry Wheeler, Bruce Musico, Eric Lee, Michael Shinn, Juan Peralta, Michelle Hart, Mark Caruso, Malcolm Patterson, Dennis Andrukat, Eric Powell, Lynn Mrowca, Craig Erlanger, John Honcharik, Raul Hernandez, James Beardsley, Mark Kowal, Robert Schaaf, Gregory Hatchett, Mallecia Sutton, Mark Notich, Nancy Kuntzleman, Barry Zalcman.

CHAIRMAN JACZKO: Okay, now if everyone could please raise their right hands. And this is going to take a little bit of time. But I will need an audible, verbal response from each of you in turn. And we will start on my left and go down the rows, one by one, starting with the first row. And I'm going to ask everyone to be seated after you provide your individual response. So here is the statement for the oath, so do you swear or affirm that the testimony you will provide in this proceeding is the truth, the whole truth and nothing but the truth.

WHEREUPON,

AMY GREENE AUGHTMAN

THEODORE E. AMUNDSON

DALE L. FULTON

EDDIE GRANT

RICHARD GRUMBIR

NEIL HAGGERTY
JOSEPH A. MILLER
DONALD P. MOORE
CHARLES PIERCE
JERRY G. SIMS
WESLEY SPARKMAN

having been identified as witnesses for the Southern Nuclear Operating Company, individually duly swore or affirmed as follows:

AMY GREENE AUGHTMAN: I do.
THEODORE E. AMUNDSON: I do.
DALE L. FULTON: I do.
EDDIE GRANT: I do.
RICHARD GRUMBIR: I do.
NEIL HAGGERTY: I do.
JOSEPH A. MILLER: I do.
DONALD P. MOORE: I do.
CHARLES PIERCE: I do.
JERRY G. SIMS: I do.
WESLEY SPARKMAN: I do.

WHEREUPON,

MICHAEL JOHNSON.
FRANK AKSTULEWICZ
RAVINDRA JOSHI
DENISE MCGOVERN

LARRY HARRIS

EDWARD ROACH

DUNCAN WHITE

BARRY WRAY

MICHAEL DUSANIWSKYJ

SESHAGIRI RAO TAMMARA

BRAD HARVEY

JILL CAVERLY

WEIJUN WANG

BRET TEGELER

SARAH TABATABAI

THOMAS SCARBROUGH

JENNIFER DIXON-HERRITY

KAIHWA ROBERT HSU

EILEEN MCKENNA

MOHAMED SHAMS

DAVID TERAO.

YI-HSIUNG HSII

JOHN SEGALA

JOHN MCKIRGAN

TERRY JACKSON

TANIA MARTINEZ-NAVEDO

OM CHOPRA

LARRY WHEELER

BRUCE MUSICO

ERIC LEE
MICHAEL SHINN
JUAN PERALTA
MICHELLE HART
MARK CARUSO
MALCOLM PATTERSON
DENNIS ANDRUKAT
ERIC POWELL
LYNN MROWCA
CRAIG ERLANGER
JOHN HONCHARIK
RAUL HERNANDEZ
JAMES BEARDSLEY
MARK KOWAL
ROBERT SCHAAF
GREGORY HATCHETT
MALLECIA SUTTON
MARK NOTICH
NANCY KUNTZLEMAN
BARRY ZALCMAN

having been identified as witnesses for the staff of the Nuclear Regulatory Commission, individually duly swore or affirmed as follows:

MICHAEL JOHNSON: I do.
FRANK AKSTULEWICZ: I do.
RAVINDRA JOSHI: I do.

DENISE MCGOVERN: I do.

LARRY HARRIS: I do.

EDWARD ROACH: I do.

DUNCAN WHITE: I do.

BARRY WRAY: I do.

MICHAEL DUSANIWSKYJ: I do.

SESHAGIRI RAO TAMMARA: I do.

BRAD HARVEY: I do.

JILL CAVERLY: I do.

WEIJUN WANG: I do.

BRET TEGELER: I do.

SARAH TABATABAI: I do.

THOMAS SCARBROUGH: I do.

JENNIFER DIXON-HERRITY: I do.

KAIHWA ROBERT HSU: I do.

EILEEN MCKENNA: I do.

MOHAMED SHAMS: I do.

DAVID TERAO: I do.

YI-HSIUNG HSII: I do.

JOHN SEGALA: I do.

JOHN MCKIRGAN: I do.

TERRY JACKSON: I do.

TANIA MARTINEZ-NAVEDO: I do.

OM CHOPRA: I do.

LARRY WHEELER: I do.

BRUCE MUSICO: I do.

ERIC LEE: I do.

MICHAEL SHINN: I do.

JUAN PERALTA: I do.

MICHELLE HART: I do.

MARK CARUSO: I do.

MALCOLM PATTERSON: I do.

DENNIS ANDRUKAT: I do.

ERIC POWELL: I do.

LYNN MROWCA: I do.

CRAIG ERLANGER: I do.

JOHN HONCHARIK: I do.

RAUL HERNANDEZ: I do.

JAMES BEARDSLEY: I do.

MARK KOWAL: I do.

ROBERT SCHAAF: I do.

GREGORY HATCHETT: I do.

MALLECIA SUTTON: I do.

MARK NOTICH: I do.

NANCY KUNTZLEMAN: I do.

BARRY ZALCMAN: I do.

CHAIRMAN JACZKO: Thank you. The witnesses present as identified by counsel have now been sworn in. Are there any objections to submitting the witness list into the record?

STAN BLANTON: No objection.

ANN HODGDON: No objection.

CHAIRMAN JACZKO: Hearing none then, the witness lists are admitted into the record of this proceeding. Now I'll turn to admission of evidence, pursuant to our September 14th scheduling order both the staff and the applicant have provided to the Secretary a table listing all of the exhibits they intend to propose for admission into evidence at the hearing. For those exhibits that are written testimony, the sponsoring witnesses have provided written certification that one, the testimony was prepared by the witness or under the witnesses direction; two, that the written testimony is true and correct to the best of the witnesses information, knowledge and belief; and three, that the witness adopts the identified testimony as his sworn testimony in the proceeding.

Counsel for the applicant, do you have any additions, deletions or changes to your revised exhibit table served on September 26th or to the testimony included in your revised and updated exhibit table?

STAN BLANTON: No, sir.

CHAIRMAN JACZKO: Hearing none, let the record reflect that the applicant's exhibits have been identified and marked as indicated on the applicants revised exhibit table. Counsel for the staff, any objections to the admission of the exhibit table or any of the exhibits listed in the table?

ANN HODGDON: No objection.

CHAIRMAN JACZKO: Okay, the applicant's consecutively

numbered exhibits SNC000002 through SNC000007, SNC000009 and SNCR20001, SNCR00008 and SNCR00010 as identified on the applicant's revised and updated exhibit tables are admitted into the record.

(Whereupon, the documents marked as Exhibits SNC000002 through SNC000007, SNC000009 and SNCR20001, SNCR00008 and SNCR00010 for identification, were admitted into the record.)

Counsel for the staff do you have any additions, deletions or changes to your revised exhibit table served on September 23rd or to the testimony included on your revised exhibit table?

ANN HODGDON: No, we do not.

CHAIRMAN JACZKO: Given that there aren't any, then let the record reflect that that staff's exhibits have been identified and marked as indicated on the staff's revised exhibit table.

CHAIRMAN JACZKO: Counsel for the applicant; are there any objections to the admission of these exhibits?

STAN BLANTON: No objections.

CHAIRMAN JACZKO: Okay, hearing none the staff's consecutively numbered exhibits NRC, I'm just going to say 1 through NRC 9, sub parts A through D of exhibit NRC 7 and sub parts A and B of exhibit NRC 8, NRCR10 through NRCR13 and NRC14 as identified in the staff's revised exhibit table are admitted into the record.

(Whereupon, the documents marked as Exhibits NRC000001 through NRC000014 for identification, were admitted into the record.)

Okay. With that we are now ready for our first panel during which the applicant will provide a general overview of its application.

Would all witnesses seated at the table, well please come to the table first and then we'll go from there.

Okay, we are now ready for our first panel during which the applicant will provide a general overview of the application. Will the witnesses at the table please state your name and title for the record?

WHEREUPON,

JOSEPH MILLER

CHUCK PIERCE

were called as witnesses for Southern Nuclear Operating Company and, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:

JOSEPH MILLER: My name is Joseph Buzz Miller; I'm Executive Vice President for Nuclear Development for Southern Nuclear Operating Company and for Georgia Power Company.

CHUCK PIERCE: And my name is Chuck Pierce, I'm the AP1000 Licensing Manager for Southern Nuclear Operating Company.

CHAIRMAN JACZKO: Well you'll have about 30 minutes for your presentation and then we'll have about 30 minutes of Commission questions following that. Thank you, you can begin.

JOSEPH MILLER: Good morning, thank you Mr. Chairman and Commissioners. As stated my name is Buzz Miller, Executive Vice President for the applicant, Southern Nuclear Operating Company as well as for Georgia Power Company. I also represent our co owners, Oglethorpe Power, The Municipal Electric Authority of Georgia and the City of Dalton.

This is a truly historic occasion as this Commission considers the issuance of the first combined license under Part 52 of its regulations. On behalf of the employees and customers of Southern Company, we would like to begin by thanking the NRC, especially the NRC staff for its diligence in conducting a thorough but efficient review of our application.

Likewise, I would like to recognize the members of our Southern Company team and our partners in NuStart, who have worked tirelessly over the past several years to reach this point. My purpose today is to provide you with an overview of the Vogtle construction program and the importance of the timely issuance of the COL and the limited work authorization Bravo to that construction program. After my remarks, our licensing manager for Vogtle Units three and four, Chuck Pierce, will spend a few minutes describing the combined license application. Next slide please.

As you know, Vogtle units three and four are planned to be the first units built in the United States utilizing the Westinghouse AP1000 passive design. The rulemaking proceeding reviewing of the AP1000 has been conducted in parallel to the review of our combined license proceeding. Our employees have been active and interested participants in many interactions with Westinghouse and the NRC staff regarding the certification of the amendments to the AP1000 standard design. We believe that the NRC staff's review, which has involved countless hours of technical analysis of the safety of the design, has resulted in a very sound, safe and workable design. Next slide please.

This slide simply illustrates the near term construction activity required to support completion of Vogtle Unit 3 in 2016 and Vogtle Unit 4 in 2017. We began to excavate the foundations for the nuclear islands and turbine buildings in 2009. And later in 2009, the NRC issued the early site permit for Vogtle which included a limited work authorization Alpha, authorizing the placement of back fill in the excavation and the construction of nuclear island mud mats, mechanically stabilized earth retaining walls and the waterproof membrane.

Installation of rebar in the nuclear islands will proceed when authorized by the NRC by issuance of either the combined license or additional limited work authorizations. Next slide please.

Here you can see the Vogtle site, it's located in eastern Georgia, south of the City of Augusta, east of Waynesboro and just across the river from the Savannah River site. The Vogtle site is situated more than 100 miles inland from the Atlantic coast and sits 220 feet above sea level. As you know there are also two operating Westinghouse units on the site. Next slide please.

This slide summarizes the status of key activities authorized by limited work authorization Alpha to prepare the nuclear island foundations. As you can see in bold in the second bullet, Unit 3 foundation work has been completed to the point needed to begin rebar installation. Next slide please.

This overhead picture of the site captures the progress of limited work authorization Alpha activities that I referenced on the previous slide as well as other significant activities including

installation of the heavy lift derrick foundation, installation of cooling tower foundations, installation of circulating water pipe and preparation of the assembly pad for CR 10, which is the rebar cradle for the containment vessel bottom head. Next slide please.

Adjacent to the west side of the previous photo, fabrication of the containment vessel bottom head has been initiated. Welding of the bottom head plates began earlier this month. Also in the background behind the bottom head is the module assembly building where platens are in place to support assembly of module CA 20 which is the auxiliary building for the AP1000 and module CA 01 which will support the reactor vessel and the steam generators. Next slide.

This photograph shows the Unit 3 nuclear island mud mat and mechanically stabilized earth walls which will serve as the form for both the nuclear island foundation and the walls. Next slide please.

So in this slide we illustrate the linkages between the NRC's review schedules and our construction schedule. We are ready to commence installation of rebar now in unit three.

Given that the NRC schedule for the combined license is linked to the schedule for approval of the AP1000 rulemaking, both of those processes are critical to the continuation of our construction sequence. Next slide please.

Based on the schedule interaction presented on my previous slide, we have requested this Commission to address a policy question relative to the timing of issuing limited work authorization Bravo and or the combined licenses as promptly as possible after Commission

affirmation of the AP1000 rulemaking. We requested that you consider issuance of the limited work authorization and combined license based on the affirmation of the AP1000 rulemaking rather than delaying until 30 days after publication of the rule. We will be in a position to implement the rulemaking as soon as it is affirmed. Continuing the construction sequence with minimal disruption supports both project quality and safety. I respectfully renew our request to the Commission to consider our policy question. Now I would like to introduce our Licensing Manager, Chuck Pierce, who will briefly summarize our combined license application.

CHUCK PIERCE: Thank you, Buzz. For my portion of the presentation I will focus on Southern Nuclear's combined license application. The Vogtle 3 and 4 application was developed under the regulatory provisions of Reg Guide 1.206 which is titled, "The Combined License Applications for Nuclear Power Plants." This combined regulatory standard provides detailed NRC expectations of what should be in combined license applications. NUREG 0800, the standard review plan for the review of safety analysis reports for nuclear power plants was used to inform this application material. Various NEI templates or Nuclear Energy Institute templates were applied as well. In applying the appropriate 10 CFR Part 52 provisions, the Vogtle 3 and 4 combined license application incorporates the AP1000, DCD Revision 19 with a limited set of departures and the Vogtle 3 and 4 early site permit, site specific analysis report also with a few variances.

In April 2009, Vogtle 3 and 4 became the reference combined

license application or RCOLA for the AP1000 fleet. Next slide.

In this role as the reference combined license application. The industry made use of the NRC philosophy. Next slide please, okay.

In this role as the reference combined license application, the industry made use of the NRC philosophy of one issue, one review, one position which is also known as the design centered review approach. I will briefly discuss how that worked. The NuStart design centered working group working for the AP1000 community would establish one standard position for the AP1000 fleet. If Southern Nuclear agreed with that position, Southern Nuclear would then incorporate the position into the Vogtle 3 and 4 combined license. The remainder of the AP1000 fleet would then use this identical position as their own unless there were site specific reasons. This position would then be submitted to the NRC which would work its way through the NRC review process. Thus once the NRC review process was complete for Vogtle 3 and 4, the NRC could then apply those conclusions to the remaining AP1000 fleet. This resulted in a maximum standardization benefit for both the industry and the NRC. As noted in this slide, the design centered working group consists of South Carolina Electric and Gas, Duke Energy, Progress Energy, Florida Power and Light and Tennessee Valley Authority. The NuStart organization also provided a centralized focus to interact with Westinghouse, NEI and the NRC staff through numerous public forums to address questions and issues. Next slide.

This slide focuses on some historic information regarding the Vogtle 3 and 4 combined license application. The Vogtle early site

permit application was submitted in August 2006. This early site permit was developed specific to the AP1000 design. Thus the Vogtle 3 and 4 early site permit could provide more detail than previous early site permits. As NRC review activities were being completed on Vogtle early site permit, the Vogtle combined license application was submitted on March 28, 2008. Thus the Vogtle 3 and 4 program has been under detailed NRC staff review for over five years. The combined license application was submitted initially as a subsequent combined license or a SCOLA with a TVA application for Bellefonte being the RCOLA. Originally under this concept using the design centered review approach, Vogtle 3 and 4 directly incorporated into its application the applicable standard material that was being reviewed on the Bellefonte docket. As a result of TVA looking at other options for the Bellefonte site and given the Vogtle plans for a near term construction program, a transition was made for Vogtle 3 and 4 to be the reference RCOLA starting in April 2009.

Thus in April 2009, the Vogtle 3 and 4 combined license application already had the standard, applicable standard material directly incorporated. The NRC staff had already begun incorporating the applicable standard evaluations into the Vogtle safety evaluation report with open items. The COLA final safety evaluation report issued in August 2011 concludes that the issuance of the combined license would meet the associated standards and is not inimicable to the common defense and security or to the health and safety of the public. Next slide.

The point of this slide is to demonstrate the completeness

and structure of the Vogtle RCOLA application. NuStart established a common structure for the application of AP1000 utilities. Vogtle 3 and 4 as well as the other standard combined licenses generally used this format. Note that most of the detailed information being discussed today is provided in the final safety analysis report in part two and the environmental report in part three. However, other parts of the application also provide important information. Next slide.

As mentioned before, the Vogtle 3 and 4 combined license application incorporated by reference DCD Revision 19 and the early site permit site safety analysis report material. As a result, Southern Nuclear requested six departures, six variances and two exemptions from the DCD in the early site permit material. The detail of these departures, variances and exemptions is in the testimony of Amy Aughtman, Wes Sparkman and Eddie Grant. In addition the combined license application addressed the DCD combined license information and holder items and the early site permit combined license items.

Finally some of the early site permit conditions were addressed in the combined license applications such as the relocation of the technical support center. Next slide.

There are approximately 875 ITAAC per unit tied to the Vogtle 3 and 4. Of these there are approximately 819 ITAAC in DCD Rev. 19 and 56 ITAAC from either the early site permit or the combined license. The 56 site specific ITAAC comprise such issues as site back fill, emergency planning and security related changes. Next slide.

Part of the analysis of the Vogtle 3 and 4 early site permit

and combined license application was to demonstrate that the characteristics of the site are bounded by the parameters in DCD Revision 19. For those cases where Vogtle 3 and 4 was not demonstrated to be bounding a justification would need to be provided. Southern Nuclear's evaluation of the site comparison confirmed that the site parameters are indeed within the DCD bounding parameters evaluated in DCD Revision 19. Later, Southern Nuclear's presentations will expand on this concept. Next slide.

Finally another important area of the COL application is the environmental report. Southern Nuclear submitted a complete environmental report with its Vogtle 3 and 4 early site permit application which analyzed all environmental issues associated with both construction and operation. Subsequently the NRC's early site permit and environmental impact statement resolved these issues and concluded that there were no unresolved environmental issues. The COL application then provided a new and significant review of the finding in the early site permit final environmental impact statement. This Southern Nuclear review concluded that there was no new and significant information. Later in our presentations Dale Fulton will discuss the early site permit amendments and how they were addressed in this process.

The NRC staff then reviewed Southern Nuclear's new and significant information, provided their conclusions in the combined license final supplemental environmental impact statement issued in March 2011. The NRC agreed with Southern Nuclear's conclusions and they were -- that there were no additional new and there were no new and

additional significant information. And found that the early site permit and environmental impact statement findings are still applicable. Additionally the NRC concluded that the environmental, economic and technical benefits of the project outweigh the environmental impacts and other costs and that the COL should be issued. Next slide.

In conclusion the Vogtle 3 and 4 combined license application is the reference combined license or RCOLA for the AP1000 fleet. This combined license application has incorporated by reference DCD Rev 19 and the Vogtle 3 and 4 early site permit, SSAR or site specific analysis report. This application is complete and has undergone extensive regulatory reviews by the NRC staff and the ACRS. The results of these reviews demonstrate that these two units can be safely constructed and operated on the Vogtle site. Southern Nuclear is confident that the Commission review will substantiate this conclusion. Thus Southern Nuclear believes that all required findings can be made by the NRC to allow issuance of the LWAB and the Vogtle combined licenses. This concludes my remarks. Thank you for your attention.

CHAIRMAN JACZKO: Well thank you for that. We'll now proceed with six minutes of questions for each Commissioner and I will start. Either Mr. Miller or Mr. Pierce, on Slide 10 of your presentation you use the phrase that the LWAB at the earliest allowable date would benefit quality of construction in a number of ways. And then you say it avoids destruction of construction processes important to quality. That seems to imply that you'll be unable to maintain acceptable quality if construction is disrupted. Can you provide me more detail about that

and what the challenges would be in terms of quality and again quality has a certain meaning in this context. And I'm wondering if it's meant in that context or what exactly do you mean by quality in that case?

JOSEPH MILLER: Okay, Mr. Chairman, I'll give you an answer for that. First of all, the sentence is not meant to imply that we cannot maintain quality in the nuclear sense. But it is meant to emphasize as we are handling a very complex schedule and work in the nuclear island specifically involves thousands of different craft that will be coming and going, and training on nuclear safety and culture, there's a continuity to the construction sequence. And by maintaining that continuity, it certainly makes maintaining both personnel safety and nuclear quality a much more manageable item.

CHAIRMAN JACZKO: When you originally received the LWA, were you anticipating that there would be a gap at this period or how were you anticipating maintaining the challenges or dealing with the challenges that you are experiencing or you would anticipate experiencing?

JOSEPH MILLER: I assume you are referring to the LWA Bravo that's in --

CHAIRMAN JACZKO: I'm referring to the LWA Alpha when you received it, when you had a plan and you initiated construction at a certain point in that -- construction you had a plan for completing that work at a certain point. Were you anticipating at the time that work was completed you would have a COL issued at that point?

JOSEPH MILLER: That's correct.

CHAIRMAN JACZKO: What in your mind was the basis for the COL not being issued at that point?

JOSEPH MILLER: Well as we've talked about the parallel process is ongoing and reviewed by the Commission. Our COL depends on the affirmation of the design certification document revision. And the delay in getting the DCD approved results in a commensurate delay in getting the license.

CHAIRMAN JACZKO: Was part of the reason for a delay in the DCD a need to rework the design cert because there were pieces of the designed certification that were unacceptable to the staff?

JOSEPH MILLER: I believe that's a partially accurate assessment.

CHAIRMAN JACZKO: What would be partially inaccurate about it?

JOSEPH MILLER: Partially accurate assessment, I think there's probably other modifications and things that Westinghouse discovered along the way that weren't necessarily the staff problems they made to the DCD.

CHAIRMAN JACZKO: About how long do you think those contributed to delay in the schedule?

JOSEPH MILLER: I could only -- maybe Chuck could allow but I could only quantify it from a macro sense, that we originally expected the process for DCD approval of revisions to occur more toward the first quarter of this year.

CHAIRMAN JACZKO: So six months, maybe six months or more?

JOSEPH MILLER: Roughly.

CHAIRMAN JACZKO: Okay, thanks. The issue of the LWAB is something that I think was also bought up in your statements. And the ability of the NRC to issue the LWAB is also dependent on the AP1000 design certification rulemaking. Why, perhaps you could give some better explanation to why you chose to make the LWAB dependent on the AP1000 design certification amendment instead of standalone independent action like the LWA was?

JOSEPH MILLER: I'll let Mr. Pierce elaborate a little more but in a general sense the activity included in LWA Bravo requires, is contained in the design certification amendment and requires approval of the design certification.

CHUCK PIERCE: The LWA Alpha when it was submitted did depend on the early site permit being approved. There were, it did address some of the seismic evaluations in the early site permit, of course a fitness for duty and QA programs and so forth. They were all in the early site permit. So it did depend on the early site permit. The LWA Bravo does depend on a number of areas that are specifically in the certification. So it was, the decision would be, was to submit, completely submit design certification material which could be somewhat inefficient for the staff and for us or to rely on the certification which was more efficient, a more efficient process.

CHAIRMAN JACZKO: Now on your slide and this is Slide 10, you have a statement that the SNC has requested by letter that the COL LWA be issued based on affirmation of AP1000 design certification rule. And

then you have a statement there that affirmation would constitute final Commission approval of the design, necessary findings could be made. Where you state that affirmation would constitute final Commission approval, is that the position of Southern Company or do you believe that's the position of the NRC?

JOSEPH MILLER: No, we believe that is the position that, we believe that is a position that NRC can take is an option.

CHAIRMAN JACZKO: But is it currently? That statement says it would constitute final approval that is your opinion as Southern based on your reading and interpretation?

JOSEPH MILLER: That is correct.

CHAIRMAN JACZKO: Okay, thank you. I think those are all my questions. Thank you. Commissioner Svinicki.

COMMISSIONER SVINICKI: Thank you. My question can be answered by either witness but I suspect it will fall to you, Mr. Pierce. On Slides 12 and 13, you discuss the assumption of the role by Vogtle of the reference COLA and you discuss that at some length on Slides 12 and 13. What I would like you to probe maybe by the use of examples for me though, as the applicant what affect if any did the assumption of the role of being the reference COLA have in your view of the review of the application and your engagement with the staff? You do reference in Slide 13 that Vogtle includes the applicable Bellefonte three and four standard material. But could you use maybe a specific example of an area where having mid process to assume the role of being the reference COLA, how that, if it did alter the process for you as an

applicant, what was the affect? Also could you maybe speak about, you've also invoked the ESP process which is another delta. Was that also a factor in how the review process moved forward for you when you had to assume the role of being the reference COLA?

CHUCK PIERCE: With regard to the reference COLA, the change was that the standard material if you go look at our combined license application, there'll be sections that'll be specifically designated standard material sections. That standard material previously was being reviewed on the Bellefonte docket and the NRC evaluations were going to the NuStart Bellefonte docket. When Southern Nuclear became the -- and Vogtle 3 and 4 became the RCOLA, those standard materials evaluations were then being directly applied to the Vogtle 3 and 4 docket. As far as a number of examples are concerned, many of the specific system evaluations of raw water and those type of evaluations, security and some of the other evaluations of that type were now done on the Vogtle docket and then applied to the other dockets, rather than being done on the Bellefonte docket.

COMMISSIONER SVINICKI: So in terms of the site specific evaluation, what I'm drawing from your answer is that this was an easily identified and designated universe of standard material that needed to be incorporated. And then in terms of the incorporation of it into the Vogtle application, that was something that was somewhat seamless from your experience as an applicant, is that correct?

CHUCK PIERCE: That's correct, all the material that is standard is specifically identified as standard in the Vogtle combined

license application. So it's the transition was fairly seamless from that point of view.

COMMISSIONER SVINICKI: Okay, thank you. That's my only question and I would ask to reserve the balance of my time. Thank you.

CHAIRMAN JACZKO: Commissioner Apostolakis.

COMMISSIONER APOSTOLAKIS: Thank you, Mr. Chairman. Since this is the first COL application under Part 52. I'm just curious, what was the level of effort devoted to this application say in responding to requests for additional information from the staff preparing for meetings with the staff and the ACRS and so on, can you give me some idea?

CHUCK PIERCE: Wow, the --

COMMISSIONER APOSTOLAKIS: Was it a day or two?

[laughter]

CHUCK PIERCE: I think the best way to answer that would be relative to the staffing levels that we actually used to do, to support this work. If you look at just the Vogtle 3 and 4 team throughout the combined license process, we probably averaged 15 or 20 FTE in dealing with the various issues when you look at the contractors we used and our own internal team. So there was a lot of people that were employed throughout the process. If when you -- when you look at the NuStart organization and their oversight and support as well, you could probably add another five, six, seven or eight people. So I mean, it was a large staff of people that was on a day to day basis dealing with the various questions and ACRS activity and so forth.

JOSEPH MILLER: Commissioner, I think he's understating a little bit. If you think of the timeline of this starting with the ESP being prepared in 2005, we're going on roughly six years here of constant interaction, both on the ESP and the combined license, addressing issues with the staff, addressing issues with the vendor Westinghouse on the design and interaction with them, obviously addressing issues relevant to the combined license. So it's a, you know, the level of FTEs has increased over the time and it has been a constant incredible effort by our staff.

COMMISSIONER APOSTOLAKIS: Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Magwood.

COMMISSIONER MAGWOOD: Thank you, Chairman. I just really have one question at this point but I wanted to, well first welcome. I appreciate having both of you here today because as you noted earlier, this is an historic event. And it's worth noting that it's an event that isn't just six or eight years in coming, it's probably an event that's more like 20 years in coming. There's been a lot of work by thousands of people over the years and different organizations including obviously Southern Company but many other utilities reflected NuStart and other organizations. Also the Department of Energy and I didn't want the day to go by without acknowledging my colleagues at the Department of Energy who worked so hard to move some of these processes along. And I also think it's worth noting that this is an effort that has involved NRC staff on a very intimate for more years than I think many of them really care to count. So I think the public should

understand that this is a process that's involved many hundreds, if not thousands of people over a very long period of time thinking about these issues and trying to do the best job possible to bring this application before the Commission. So it's been -- and I think as I've gone through the many volumes of paper that have led to this, it has impressed me as to how much work has gone into this. So I wanted to let both the applicant and the staff know that I recognize the vast effort that has gone into this and appreciate what all of you have contributed to it.

However one of the things about this process and anything this complicated that does come up is that there'll always be these inevitable adjustments and changes as we go forward as much as we try to have a standard design. As we've already seen in this process which has led to the staff creating the changes during construction process. And we have in this institute, this preliminary acceptability review process which is assigned to assist that. And my question for you is how much of that process do you expect to use going forward? What additional license amendments might be necessary if the license is issued? And if you can anticipate those now, why were those not built into the license in the first place? I wonder if you could give some thoughts about that.

CHUCK PIERCE: Okay. Starting with the second part of the question first and that is why weren't those built into the license, for the license amendments that we're looking at issuing shortly after we receive the license, the license amendment request that we're looking at issuing. Those were -- there is a point in time where under, as you

move through the process you need to make a start, you need to let the COL sort of move to conclusion. You need to let the design certification move to conclusion. And so there was -- so IGS-11 was contemplated and created that provided guidance on what type of issues and what type of changes would need to go before the NRC as part of the process and which issues or changes could be deferred until the COL has been received. So there are some specific changes that we're looking at today that will need to be processed after we get the COL, the combined license application. Now for those, you are correct that there is now this changes during construction process that is currently under development. For the preliminary amendment request that you mentioned, I really don't expect that we'll be using at least initially that process very often. As a matter of practice, initially for the amendments that we're looking at right now, the initial submittal of them, those amendments really can be processed without having to apply a PAR. But as we get into the process and get into construction, there may be needs for short turn around items during construction where we'll need to use the PAR process. But for the ones that we're looking at right now, that is not needed.

COMMISSIONER MAGWOOD: Okay, thank you. Thank you Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman. I want to join with my colleagues comments in acknowledging the historic nature of this hearing today and in acknowledging the extreme hard work by the

license applicant and the NRC staff. I think this is a very significant occasion. I want to start out with Mr. Pierce with the one question that is related to Commissioner Svinicki's question about the reference COL shifting from Bellefonte to Vogtle. I know that you touched on that a bit but from a process standpoint, were there any difficulties or lessons learned in trying to shift from Bellefonte being the reference to Vogtle being the reference COL?

CHUCK PIERCE: In making the shift itself, I think that one aspect that was -- I mean it was the way it worked and I don't know if would call it lessons learned is that when you're doing it in process, you can't make the change overnight. At that point in time when we made the transition, the Bellefonte draft SAR safety evaluation reports were being generated. That needed to be allowed to go to completion. And so the transition was started in April 2009 but actually took several months as that transition was formally completed. So it wasn't something that happened, you know, at one point in time. It took several months for that to be made. So I think that was the primary lesson let's say I took away, you just really can't declare that it's done on this day but we started in April.

COMMISSIONER OSTENDORFF: Okay. The second question and Commissioner Magwood touched on this with respect to looking forward, recognizing any construction project is going to have things that come up, that emerge as new issues or challenges, that could not be foreseen basing it to circumstances. Are there -- and I understand that Southern Company has been watching closely the AP1000 construction over in China

and I'm wondering just at a high level, are there any particular areas of construction that you have looked at in the China experience to date that would perhaps be areas of particular focus for Southern as you move forward with the Vogtle construction project?

JOSEPH MILLER: I would, Commissioner, I would answer the question this way, the Chinese are proceeding very rapidly. The level of design as they finish it, they're implementing it in a much more rapid pace than is set up for Vogtle 3 and 4. So a lot of the issues that they're finding in construction have been lessons learned that have been taken back by Westinghouse and by Shaw and incorporated into construction technique that will be used. A very simple one that's just the way to assemble certain modules, instead of horizontally, they'll be done vertically at our site. We do know that the Chinese had several issues with penetrations and things that in our framework would have required obviously the change process to work. Without question, there will be some that we have to apply but to the extent practical that those lessons from China have already been incorporated. They're being incorporated in readiness reviews and construction reviews and we'll identify them early, to the extent that they exist. And we'll follow the process.

COMMISSIONER OSTENDORFF: Thank you. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Any other questions from anyone? Okay, well thank you very much for your testimony. We'll now turn to the staff. We're now ready for our second panel. During this panel

representatives of the NRC staff will provide an overview of key safety information related to the AP1000 design certification, review important licensing activities related to the application and provide a summary of its regulatory findings. Would all of the witnesses state your name and title for the record?

WHEREUPON,

MICHAEL JOHNSON

FRANK AKSTULEWICZ

ROBERT SCHAAF

was called as a witness for the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

MICHAEL JOHNSON: Michael Johnson, Director of the Office of New Reactors.

FRANK AKSTULEWICZ: I'm Frank Akstulewicz; I'm the Deputy Director for Licensing Operations in the Division of New Reactors, Office of the New Reactors.

ROBERT SCHAAF: I'm Bob Schaaf; I'm the Acting Division Director for the Division of Site and Environmental Reviews in the Office of New Reactors.

CHAIRMAN JACZKO: Do you want to begin, Mike?

MICHAEL JOHNSON: Yes, good morning Chairman and Commissioners. It's my pleasure to address the Commission today at this public meeting. I'll provide a few, brief introductory remarks to preface the staff's overview that follows. With me this morning of

course is Frank Akstulewicz and Robert Schaaf, who are in the organization, who will make presentations following my overview. Mr. Akstulewicz and Mr. Schaaf will provide an overview. Slide two please.

Mr. Akstulewicz and Mr. Schaaf will provide an overview of the staff evaluation for the Vogtle Electric Generating Plant, Unit 3 and 4, combined license application, and the limited work authorization request. This will include an overview of the safety review, including the use of the design center review approach, the staff's environmental review, and a summary of the regulatory findings of the staff based on its safety and environmental review has made related to the combined license application and the limited work authorization request.

Mr. Akstulewicz will also provide a status of the AP1000 design certification amendment rulemaking, which the Vogtle application incorporates by reference and will discuss the issues, and presentations that will be provided to you later today and tomorrow. The Vogtle review is the first combined license review completed by the staff. This is a major milestone and the preparation of the safety and environmental review is a significant accomplishment by the staff.

The staff completed its review of the Vogtle combined license application in August of 2011. The review began in the first half of 2008 when the applicant submitted its initial version of the application. Since then, the staff has expended approximately 26,000 hours on the safety review and 5,000 hours on the environmental review, which involves well over a hundred engineers, scientists, and technical specialists. During this time, the staff conducted over 60 public

meetings and conference calls in support of the Vogtle combined license review. The applicant responded to over 500 staff questions, including over 70 questions associated with the environmental review and 460 related to the safety review. In addition, the staff considered more than 300 comments on the draft supplemental environmental impact statement. Additional efforts were provided by technical support contractors under NRC monitoring. Contractors provided approximately 8,000 hours to support the environmental and safety reviews.

While completing its review of the Vogtle application, the staff performed in parallel, a review of the amendment to the AP1000 design certification. The final safety evaluation report for the AP1000 review was issued in August of this year. The AP1000 was also a major project for the new reactor program. The staff expended approximately 52,000 hours in completing the AP1000 review.

Within the NRC, of course the Office of New Reactors led the review effort and provided most of the staff technical expertise. However, other offices provided significant expertise. The Office of Nuclear Security and Incident Response conducted evaluations in the security, and emergency preparedness area. The Office of Nuclear Reactor Regulation conducted evaluation in the financial review area and assisted with resolution of some issues, some safety issues.

The Office of Nuclear Material and Safety and Safeguards, the Office of Federal and State Materials and Environmental Management Program and Region One provided support in Part 30, Part 40 and Part 70 license reviews, and of course, the NRC Region Two Office supported

environmental meetings in the community, around the Vogtle site. The Department of Homeland Security also contributed to the NRC Review. The staff has found that the final safety evaluation report of the final supplemental environmental impact statement and our statement in support of the hearing provide an adequate basis for meeting the necessary regulatory findings and we look forward to participating in the mandatory hearing and successful completion of the hearing phase of the Vogtle combined licensing process.

I'll now turn the presentation over to Frank Akstulewicz and Robert Schaaf for the balance of the staff overview. Thank you.

FRANK AKSTULEWICZ: Thank you, Michael. Good morning. Next slide, please. On March 28th, 2008 Southern Nuclear Operating Company on behalf of itself and four co-owners submitted its application to the NRC for combined licenses for two AP1000 advanced passive pressurized water reactors to be located on the existing Vogtle units one and two site in Burke County, Georgia. The Vogtle COL application incorporates by reference 10 CFR Part 52, Appendix D, the design certification rule for the AP1000 design and the Westinghouse Electric Corporation application for amendment to portions of the design control document revision 19. The application also incorporates by reference the Vogtle early site permit, revision 5, dated December 23rd, 2008, as approved by the NRC and the Vogtle early site permit, and the limited work authorization number one.

In addition, the NRC issued three amendments to the early site permit on May 21st, June 25th, and July 9th, 2010. As discussed by

the applicant, the limited work authorization one includes the installation of engineered backfill retaining walls, lean concrete backfill, mud mats, and the waterproof membrane on which the nuclear island will rest. In its presentation earlier today, Southern Nuclear provided pictures of some of those activities that have occurred and are occurring on the site. Next slide, please.

The staff safety evaluations associated with the AP1000 design certification document and the Vogtle early site permit that are incorporated by reference are found in NUREG 1793, titled Final Safety Evaluation Report related to Certification of the AP1000 Standard Design and its Supplements and in NUREG 1923, the Safety Evaluation Report for an Early Site Permit at the Vogtle Electric Generating Plant Early Permit Site, respectively. The FSER, which I will use repeatedly throughout my statements as the final safety evaluation report, for the AP1000 design amendment was issued on August 5th, 2011, and the staff is currently taking steps to issue that document as supplement two to NUREG 1793. Based on the finality that NRC regulations afford to a certified design or early site permit referenced in a combined license application the scope of this application review as it relates to the certified design is more limited than it would be for a combined license application referencing neither. What that means is that for safety issues, the staff's combined license review team did not need to perform a technical review of items that were resolved within the scope of the certified design or the early site permit. Rather, the combined license review focused on aspects of the application such as combined license

information items, design information, replacing conceptual design information and programmatic elements that are the responsibility of the applicant. Similarly, because the staff's environmental review of the Vogtle early site permit resolved all environmental issues. The staff's combined license stage environmental review was limited to a review of new and significant information.

In addition to incorporating by reference the AP1000 design certification and early site permit, the Vogtle combined license application also consists of sections that are standard for combined license applicants in the AP1000 design center. Standard content material refers to the portions of the application, which if incorporated by reference, by subsequent COLs will be able to take advantage of the single review performed for the reference combined license. The applicant identified the standard content material in its final safety analysis report, by the use of left margin annotations. In the Vogtle combined license FSER, the staff notes, those portions of the review that will be considered as resolution of standard content through the use of indented italicized text. Because the AP1000 reference combined license application changed from the Tennessee Valley Authority Bellefonte Station to Vogtle, a portion of this standard review was performed during the review of the Bellefonte application. The Vogtle FSER reflects the closure of the Bellefonte standard content open items that were completed after the transition to Vogtle as the reference combined license. I will present more regarding the transition of the RCOL from Bellefonte to Vogtle in a later slide. Next slide, please.

The Vogtle combined license application also consists of site specific information as well as a second limited work authorization request. Specifically on October 2nd, 2009, Southern Company submitted a second LWA as part of their application. This LWA involves installing reinforcing steel, sumps and drains, and other imbedded items into nuclear island foundation base slab and placement of concrete for the nuclear island foundation base slab. The staff's evaluation of the second limited work authorization request is found in Section 3.8.5 of the Vogtle final safety evaluation report. Next slide, please.

Use of the design center review approach for the standard content sub-evaluations is summarized in Section 1.2.3 of the Vogtle final safety evaluation report. The design center review approach is described in regulatory issue summary 2006-006 and was endorsed by the Commission's staff requirements memorandum associated with SECY 06-0187, dated November 16th, 2006. The design center review approach is used in the staff review of several portions of the application, including the safety analysis report and the quality assurance plan. As described in the technical evaluation sections that rely on the design center review approach, the staff ensured that the standard content developed for the Bellefonte SER with open items was applicable to the Vogtle site.

For example, Section 17.5, which is the quality assurance program description, contains both a mixture of double indented italicized material and site specific evaluations. The Bellefonte safety evaluation with open items is quoted in the Vogtle safety evaluation and is publically available. The staff does not currently

intend to issue the Bellefonte SER as a NUREG. Next slide, please.

As mentioned earlier, Bellefonte units 3 and 4 was the reference combined license for the AP1000 design center. In April of 2009, NuStart Energy Development, LLC submitted a transition plan which the staff accepted, to change the RCOL designation for the AP1000 design center from the Bellefonte units 3 and 4 to Vogtle units 3 and 4. The staff completed the transition of the RCOL after the Bellefonte safety evaluation with open items was issued. In certain areas of the applications, the two applicants submitted similar information in an accordance with the new reactor standardization needed to support the design-centered review, licensing review approach. The staff determined that the similar information would be standard for all of the AP1000 design center and that the evaluation that had been performed was directly applicable to the Vogtle review. In portions of the Vogtle FSER, where the staff made these determinations, the technical evaluations were quoted directly from the corresponding sections of previously issued and publically available safety evaluation sections. Next slide, please.

The staff's safety review of the Vogtle combined license application was also examined by the Advisory Committee on Reactor Safeguards in accordance with 10 CFR 52.87, three AP1000 ACRS sub-committee meetings were held on the Bellefonte safety evaluation with open items related to the standard contact material. The applicant and the staff also supported for AP1000 ACRS sub-committee meetings specifically on the Vogtle application and its advanced final safety

evaluation. The staff presented the results of its Vogtle review to the ACRS full committee on January 13th, 2011. The ACRS provided this letter related to the Vogtle combined license application on January 24th, 2011. The ACRS letter contained four recommendations associated with the containment interior debris limitations, the in service inspection testing program requirements for squib valves, the power measurement uncertainty and any future changes as required because of the AP1000 design certification changes and its impact on the Vogtle FSAR.

During the subsequent SER panel presentations, the staff will provide a more detailed discussion of the first three items. The fourth issue involved the ACRS request to review with them the changes and commitments to the final design certification document and the FSAR that deviated significantly from those that the ACRS had previously reviewed.

In the staff's response dated September 13th, 2011, to question 20 of this Commission's pre-hearing questions, the staff stated that none of the changes in the Vogtle application were of sufficient significance to warrant an ACRS briefing. These changes were discussed with the ACRS, AP1000 sub-committee chair and he agreed with the staff that no further interaction was necessary. The staff's response to the ACRS, January 2011 letter report can be found in a letter dated March 3rd, 2011. The staff issued the Vogtle FSER on August 5th, 2011. Next slide, please.

In order to issue a combined license, the Commission must be able to conclude that each of the findings on this slide are met. In

its testimony to support this hearing found in SECY -11-0110, dated August 9th, 2011, the staff summarized the bases that would support the Commission's determination that the staff's review had been adequate to support the findings set forth in both 10 CFR 52.97 and 10 CFR 51.107. This SECY paper provides a no review of the findings that subject to final certification by rulemaking of the AP1000 amended design can be made in support of the issuance of a Vogtle combined license -- I'm sorry, a Vogtle combined license. I will review each finding and the staff's basis supporting the finding that can be made.

First, the applicable standards and requirements of the act in the Commission's regulations have been met. The staff review reviewed the application and evaluated it against the applicable requirements in 10 CFR, Parts 20, 26, 30, 31, 32, 40, 50, 51, 52, 55, 70, 73, 74, 100, and 140. Based on the staff's review documented in the final safety evaluation report and the environmental impact statement, and the conclusions of the ACRS, the staff concludes that for purposes of issuing combined licenses for Vogtle Units 3 and 4, the applicable standards and requirements of the Atomic Energy Act of 1954 as amended, and the Commission's regulations have been met. Second, any required notifications to other agencies or bodies have been duly made. As documented in the SECY paper, the staff believes that all required notifications, including those to the U.S. Department of Agriculture Rural Utility Service, the U.S. Securities and Exchange Commission, the Federal Energy Regulatory Commission, the Georgia Public Service Commission, and the required federal register notifications have been

made.

Third, there's reasonable assurance that the facilities will be constructed and operated in conformity with the licenses, the provisions of the Act, and the Commission's regulations.

Again, as documented in the SECY paper, the staff believes that the staff review as documented in its final safety evaluation as well as the ITAAC and license conditions contained in the combined licenses provide the necessary assurance that the plants will be constructed and operated as required.

Fourth, the applicant is technically and financially qualified to engage in the activities authorized. The technical and financial qualifications of the applicant are summarized in the SECY paper and documented in detail, in Chapter 1 of the staff's final safety evaluation.

Fifth, the issuance of the licenses will not be inimical to the common defense and security, or to the health and safety of the public. Based on the staff's review of the application as documented in its final safety evaluation, the staff concludes that the issuance of the combined licenses will not be inimical to common defense and security, or the public health and safety,

And sixth, the findings required by Sub-part A of 10 CFR, Part 51 have been made. The staff's conclusions supporting the findings required by Sub-part A, will be presented shortly by Mr. Schaaf. In addition, as summarized in SECY 11-0110, the staff believes that the analogous findings can also be made for the second limited work

authorization and that as required by 10 CFR 50.10, there are no unresolved safety issues relating to the activities to be conducted under the limited work authorization that would constitute good cause for withholding the authorization. Mr. Schaaf will now provide an overview of the staff's environmental review.

ROBERT SCHAAF: Good morning. I will be presenting an overview of the environmental review related to the Southern COL application, which referenced its early site permit and the applicant's request for a second LWA as part of the application. Next slide.

In accordance with the Commission's requirements 10 CFR Part 51 implementing Section 102(2) of the National Environmental Policy Act of 1969, the staff prepared a supplemental environmental impact statement or SEIS, for the Vogtle Units 3 and 4, COL application. If an applicant for COL references an ESP, 10 CFR 51.75 C requires the staff to prepare a supplement to the ESP EIS. In preparing the SEIS, the staff is guided by the requirements set forth in 10 CFR 51.92. Specifically, a SEIS developed for a COL referencing an ESP shall contain an analysis of those issues related to the impacts of construction and operation that were resolved in the ESP proceeding for which new and significant information has been identified. The staff will provide additional details on the new and significant process associated with the review in a later presentation on its environmental review. The ESP FEIS was completed in August 2008 and the ESP was issued a year later, in August, 2009. Next slide, please.

The staff's environmental review was based largely on the

resolution of issues at the ESP stage. The staff began its environmental review process for the Vogtle COL application by publishing a Notice of Intent to prepare a supplemental EIS in the Federal Register on September 28, 2009. In the notice the staff informed stakeholders that the SEIS for the COLs would be prepared in the same manner as the final EIS for the ESP, except that the NRC determined that it would not conduct a formal scoping process in accordance with 10 CFR 51.26(d). The staff sent consultation letters to various federal, state, tribal, and local agencies to solicit feedback from these stakeholders on any new and potentially significant circumstances or information relevant to environmental concerns related to the proposed action. The staff also conducted detailed audits concerning potential new and significant information in September, 2009, and May, 2010. Next slide, please.

The draft SEIS was issued in September, 2010. A 75 day comment period for the draft SEIS began on September 3rd, 2010, the date of publication of the U.S. Environmental Protection Agency notice of availability. The staff held a public meeting on October 7th, 2010 in Waynesboro, Georgia, to describe the results of the staff's environmental review, provide members of the public with information to assist them in formulating comments on the draft SEIS and to respond to questions, and accept comments. The staff developed responses to comments received on the draft SEIS and provided these responses in Appendix E of the final SEIS. On March 25th, 2011, the staff published the final SEIS as NUREG 1947, final supplemental environmental impact

statement for combined licenses, for Vogtle electric generating plant Units 3 and 4.

As stated in the final SEIS, the staff's recommendation related to the environmental aspects of the proposed action is that the COLs and LWAs should be issued. The staff based its recommendation on the applicant's environmental report and responses to staff requests for additional information; the staff's review conducted for the referenced early site permit application and the assessment documented in the ESP EIS; consultation with federal, state, tribal, and local agencies; the staff's own independent review of potential new and significant information available since the preparation and publication of the ESP EIS, and the assessments summarized in the SEIS, including the potential mitigation measures identified and consideration of public comments received on the draft SEIS.

Finally, the staff concluded that the requested LWA construction activities defined at 10 CFR 50.10(a), described in the site redress plan would not result in any significant adverse environmental impacts that cannot be redressed. Next slide.

This slide continues the discussion of the 10 CFR 51.107(a) findings that the staff believes can be made to support the issuance of the Vogtle Units 3 and 4, COLs, and LWAs. For the first finding, in accordance with NEPA Section 102(2)(A), the staff's environmental review used a systematic interdisciplinary approach to integrate information from many fields, including the natural and social sciences as well as the environmental sciences. The staff's review comports with the NRC's

requirements in Appendix A to 10 CFR Part 51, format for presentation of material in environmental impact statements. The staff concludes that the environmental findings in the SEIS constitute the hard look required by NEPA and have reasonable support in logic and fact. The staff's process for developing the SEIS will be discussed further in a separate panel as part of the mandatory hearing.

In accordance with NEPA, Section 102(2)(C), the SEIS for the Vogtle COL, which tiered off the ESP FEIS addresses the environmental impacts of the proposed action; any unavoidable adverse environmental effects; contains no discussion of alternatives to the proposed action, because they were resolved at the ESP stage, except for limited new information which was considered in the COL review; addresses the relationship between local short term uses of the environment and the maintenance and enhancement of long term productivity; and addresses any irreversible and irretrievable commitments of resources that would be involved in the proposed action, should it be implemented.

As supported by correspondence presented in Appendix F to the SEIS, the staff concludes that it fulfilled the requirement of NEPA Section 102(2)(C), by consulting with and obtaining comments from other federal agencies with jurisdiction by law or special expertise. In accordance with NEPA Section 102(2)(E), the ESP FEIS demonstrated that the staff adequately considered alternatives to the proposed action, to the extent that it involves unresolved conflicts concerning alternative uses of available resources.

Since siting matters were resolved at the ESP stage, the

staff SEIS did not include a separate discussion on alternative sites. Further, the staff evaluated whether any new and significant information affected the conclusions previously made in the ESP FEIS, with respect to other alternatives. As explained in the SEIS, after examining this new information, the staff determined that it did not ultimately change the staff's conclusions in the ESP FEIS.

For the second finding, Chapter 11 of the SEIS provides the staff's summary of the cost benefit assessment. The staff concluded that the construction and operation of the proposed Units 3 and 4, with mitigation measures identified by the staff would have accrued benefits that most likely would outweigh the economic, environmental, and social costs. Again, this finding is supported by the resolution of issues at the ESP stage. For the third finding, the LWA application indicates that the existing site redress plan from the Vogtle ESP application is applicable to the LWA-2 activities and the activities requested in LWA-2 would involve no additional impacts beyond those presented in the ESP FEIS. The staff verified that the site redress plan discussed in the ESP FEIS would adequately redress the impacts requested under LWA-2 in the event construction is terminated, the COL application is withdrawn or denied, or the LWAs are revoked. Therefore, the staff determined that the redress plan will adequately redress the activities performed under the LWAs, should limited work activities be terminated by the holder of the LWAs or revoked by the NRC, or upon effectiveness of the Commission's final decision denying the COL application.

For the fourth finding, the staff considered the cost benefit

analysis recognizing the resolution of issues concerning the need for power and reasonable alternatives to the proposed action at the ESP stage. In preparing the SEIS in the absence of new and significant information that would change the cost benefit conclusion. Based on that analysis, the staff recommends that the COLs be issued.

For the fifth finding, the staff believes that the Commission will be able to determine based on the record of this proceeding, that the NEPA review performed by the staff has been adequate. As will be discussed in more detail, in a later presentation, the staff performed a thorough and complete environmental review sufficient to meet the requirements of 10 CFR, Part 51, implementing NEPA and adequate to inform the Commission's action on the COL request. Thank you.

FRANK AKSTULEWICZ: Next slide, please. Although the staff's review of the AP1000 design amendment is not the focus of this hearing, because the Vogtle COL combined license incorporates the design certification, my intent is to provide just the brief status of the rulemaking activities. The AP1000 design, which is Rev. 15, was certified in January of 2006. Westinghouse subsequently submitted an application to amend that certification. The notice for the proposed rulemaking regarding the AP1000 design certification was published in February of 2011 and was based on Revision 18. The public comment period for the proposed rulemaking ended in May of this year and the NRC received over 13,000 comments on the proposed rule to which the staff is now finalizing its responses.

Subsequent to the publication of the proposed rule,

Westinghouse issued an AP1000 design certification revision 19, in June of this year. This revision includes some clarifications and information regarding peak containment pressure analysis shield building design methodology and other revisions to the application based on staff comments associated with Rev. 18. Rev. 19 includes all of the still current information from all the previous revisions. The staff issued the safety evaluation, its final safety evaluation, including Rev. 19, in August of this year and the FSER will be issued as a supplement to the previously issued FSER. The ACRS sub-committee was briefed on Rev. 19, on August 16th of 2011, and the full committee was briefed in September. The staff now expects to submit the rulemaking package to the Commission in October of this year. Next slide, please.

Over the next two days, the staff will be presenting information on the issues listed in this table. On this slide and the next, I've outlined the nature of the information that the staff will be presenting during its safety evaluation report and environmental panels, and as indicated today where we will be speaking to panels one, two, and three. That concludes my remarks.

MICHAEL JOHNSON: That concludes our presentation of the overview.

CHAIRMAN JACZKO: All right, thank you. As you look at the environmental impact statement, of course one of the most challenging aspects is the new and significant information. Did the staff consider whether the accident Fukushima Daiichi constituted new and significant information?

ROBERT SCHAAF: No, we did not include that as consideration at this time. It's continuing the review of -- under -- for the Commission.

CHAIRMAN JACZKO: Do you think that there are issues that could constitute new and significant information based on the accident?

ROBERT SCHAAF: As we evaluated it, the task force report indicated that the current plants and licensing are not expected to be affected and we await further long term task force evaluations.

CHAIRMAN JACZKO: So, you did consider the events, or no?

MICHAEL JOHNSON: We did not. We were more broadly waiting for the outcomes of the Fukushima task force and we'll apply those requirements in terms of new requirements, whether they be in safety or environmental --

CHAIRMAN JACZKO: I mean strictly from the NEPA prospective, from the standpoint of severe accidents, any of those kinds -- did you look at that from a new and significant information from a NEPA standpoint?

FRANK AKSTULEWICZ: We didn't. We did not.

CHAIRMAN JACZKO: Thanks. If we look at the COLs in particular as we transition from the design certifications to the COLs, there are a number of items that were passed through to the COL, I guess known as COL action items. What is the status of those COL action items as they get transitioned and I don't know, maybe Frank you could comment on that. How do they wind up getting incorporated? Do they get incorporated as commitments? Do they get incorporated as license

conditions or what happens with those things in the COL?

FRANK AKSTULEWICZ: There's several ways to do this and two of them that you've identified are in fact ways to do that. They can be commitments in the FSAR to follow on with certain activities.

CHAIRMAN JACZKO: What's the licensing affect of a commitment in the FSAR?

FRANK AKSTULEWICZ: A licensing effect in the -- of a commitment in the FSAR is binding, because it constitutes the regulatory basis for that particular plant, all right. It is changeable, though. There's a process that they go through to change commitments that's, that's --

CHAIRMAN JACZKO: What is that?

FRANK AKSTULEWICZ: -- governed by -- it's a commitment change process. There's a generic process that's an NEI standard process for commitments. I don't recall the specifics of that process, but it's not the same as a license amendment process. They can go through and they have to notify us that a change is happening, and we either agree with them or we don't. All right, but otherwise they can become license conditions. They can become specific -- even ITAAC, they can roll up to that, which are just another separate form of a license condition.

CHAIRMAN JACZKO: Can you -- and I don't expect you to know this now, but can you provide us with kind of a breakdown of where each of the COL action items wound up, that they wound up as commitments, they wound up as licensed conditions or what?

FRANK AKSTULEWICZ: We'll try to get that information for you. We don't have it with us right now.

CHAIRMAN JACZKO: Okay, yeah that's fine, and just again, just briefly, can you touch on the -- how do you decide which of the bins it goes into?

FRANK AKSTULEWICZ: You mean what is either going to be a commitment or a license condition. I think there's no hard and fast criteria that says if it says this is a condition of -- I think a lot of it is determined through the negotiation that happens during the review process about the relative importance of that material either being controlled or to have some additional flexibility with respect to that particular process. So, I would say it's issue specific.

CHAIRMAN JACZKO: Okay. I appreciate that. I wanted to touch briefly on the issue of LWAs. When the staff issues the LWA, does the staff make any commitments about the subsequent issuance of a COL related to that particular --?

FRANK AKSTULEWICZ: When we issue an LWA, there's no commitment made to the -- to any respect to the issuance of a COL.

CHAIRMAN JACZKO: In fact, do our regulations specifically say that the operator or the applicant in this case undertakes an LWA at their own risk or something to that?

FRANK AKSTULEWICZ: Yes, that's right. Okay, thank you.

CHAIRMAN JACZKO: One of the issues of importance of course this has been a long process. I think everybody's talked about it, everybody's worked very hard on that, on doing this and a lot of

activity on all sides, applicants, staff, stakeholders. There's a lot of different people involved, but of course at some point we kind of have to say, "Stop," and then you move forward, and but of course in that time new issues can come up. So, maybe you could just touch on briefly how we deal with emergent issues that come up after an application's been submitted and kind of where the cutoff point is for dealing with those issues.

FRANK AKSTULEWICZ: Yeah, go ahead. I'll start. I believe the correct starting point that the applicant recognized is ISG-11. It does identify very specific criteria that say, "If you meet this threshold for that type of information, it's information that must be submitted to the NRC prior to the action being taken. It's very definitive in that respect.

CHAIRMAN JACZKO: Does that go all the way up to literally the day at which we would issue a COL?

FRANK AKSTULEWICZ: Correct. That's right and that would include any errors in calculations that were identified, or significant they could potentially undermine the staff's safety conclusions.

MICHAEL JOHNSON: The other thing I would add -- thanks Frank for starting while I think, is that our oversight process is continuing and ongoing, and that can always result in identification of issues, some of which may have significant speed run through those tests and would apply those either in licensing space, or enforcement space. We have of course an allegation program that runs through -- we would end up for an allegation that would follow in the process, looking at that

allegation of course. So, as we do our oversight, we continually look and make judgments based on where we are in the process, about what changes would need to be made, if any, to ensure that the design that we approve is adequate or that the plan is safe, post COL, as we go forward.

CHAIRMAN JACZKO: Okay. Thank you. Commissioner Svinicki.

COMMISSIONER SVINICKI: Well, thank you for your overview presentation and I particularly found helpful that you focused on the safety and environmental findings that we need to make. I have them here, printed on a card just so that I will keep them front of mind as we proceed through the mandatory hearing, and Mike, I also want to state that you used the term milestone. I want to compliment you and the staff for reaching what is a significant milestone of arriving here today at the mandatory hearing. I feel also personally that you've done so in a way that was very open and also provided with all of the public meetings and the transparency. I think that most of us that weren't doing the review day to day had good visibility into what issues were open, what the approaches to resolution were, and I think that there's been as a result, a certain degree of predictability to this process that even if changes had to be made over time, people had a sense of the status of items and I appreciate that very much. I think that also facilitated the back and forth with the ACRS, and I also want to thank the ACRS, if any of them are listening for the fact that they worked with the Office of New Reactors to be able to make adjustments over time, and it would be my assessment that I think that things worked

pretty well with the right amount of flexibility from both sides. I think we were able to arrive at this in a fairly orderly process.

I do have a couple of questions, but before I begin, I noticed that -- well, I'm not sure that I understood the response to Chairman Jaczko's question about new and significant information arising out of Japan. I noticed that some of the counsel were conferring. I would ask if any representative of the Office of General Counsel would like to in any way supplement the answer that was given about new and significant information. There seemed to be a sidebar going on. Is there anything you'd like to add, because I'm not certain and even the Chairman said the answer was, "kind of yes and no." I'm not sure what the answer was.

STEPHEN BURNS: My understanding from -- excuse me, Commissioner, my understanding from Counsel is that I think one of the other witnesses who is going to appear at the environmental piece of it I think had a more specific answer to it. So, that's --

COMMISSIONER SVINICKI: Okay, but I assume you're a sworn witness, would you --

GREGORY HATCHETT: Yes. This is Greg Hatchet. I'm the branch chief of the Environmental Projects Branch where the environmental review was conducted. More importantly, during the SEIS review, the staff didn't find any new and significant information relevant to the impacts postulated accidents conducted during the ESP stage. Furthermore, after the Fukushima accident, the staff examined the task force report and noted that the task force report emphasized that a

Fukushima like event is unlikely in the U.S. and the staff determined that this did not represent new and significant information for the Vogtle Review. Additionally, for the purpose of the environmental analysis accident consequences the staff draws its key inputs from the design basis accidents in the PRA reference and design certification and the COL safety side analysis. Because those have not changed following the Fukushima event, this further supports the determination there is no currently new and significant information that would change the staff's conclusion in the SEIS.

COMMISSIONER SVINICKI: Okay, thank you for that supplementary testimony. That's helpful. Since this is the overview panel, I think something that I would find helpful, and maybe this is very basic, but as I said, you stepped through the findings. The staff has concluded that for both the safety and environmental findings that it is staff's assessment that the Commission can make an affirmative -- make the findings in the affirmative that are the regulatory findings that are necessary. But this mandatory hearing, of course, is the Commission's assessment of whether or not the review that you've conducted, in our view, permits us to make those findings.

So if we were to take -- I know we have very detailed panels coming up, but I wanted to pick a very general topic since you're the overview presenters and you're supported by, I think, the 49 witnesses that we swore in this morning, so I won't make you field all the questions more appropriate for them. But one of the findings has to do with technical qualifications of the applicant. Using that as an

example, I know that you refer to the guidance and procedures and other things that you can consider in deciding that the applicant is technically qualified. But could you describe that process again, realizing that one of the objectives here is for the Commission to be able to assess that the review you conducted is sufficient to support the regulatory findings? What would you say to me at a very high level of why you are convinced that the applicant is technically qualified? And again, I'm using that because it's a nice general example.

FRANK AKSTULEWICZ: Okay, I'll try to answer that question. Pick a specific issue. When the staff engages with the particular applicant, there's a submittal that's made that is a representation of the technical issue or the regulatory issue that's presented. And it's supported by material evidence as to whether or not a certain position's taken, right. The quality of that information goes into the staff's determination about whether the applicant understands the issue that it's evaluating, whether or not the evaluations are appropriate for the issue that are being performed and, as part of the RAI process, determines whether or not, you know, the particular applicant would continue to represent itself in a way that would -- represent that they understand what the significance is, how the issue is to be evaluated, and the outcomes that are required as a result of the action that's in front of the Commission. So it's the cumulative interaction across the spectrum of issues associated with the application review that forms the staff's opinion.

COMMISSIONER SVINICKI: Okay. Thank you. Mike, would you

like to add anything to that? Okay, thank you. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Mr. Apostolakis:

COMMISSIONER APOSTOLAKIS: Thank you, Mr. Chairman. Frank, on slide 14, you had the number that I thought was large. You received 13,000 comments?

FRANK AKSTULEWICZ: Yes. That's a large number. That's atypical of what we would receive for rulemakings, and that's the low end of the number.

COMMISSIONER APOSTOLAKIS: Okay, what can I make out of it? I mean, what does it mean?

FRANK AKSTULEWICZ: I think that the unique challenge of this particular proposed rule happened to be the timing when it was issued and the events that followed. The proposed rule went out. Then the Fukushima event happened, and so you had a lot of interest in terms of all of a sudden nuclear power and the public's perception of such and the groundswell of petitions that the Commission received to take action with respect to the operating units and the licensing. All are factored into the rulemaking comments that are coming forward to the Commission for their consideration.

So, one other factor was that in order to be open and receptive to trying to capture as much of the comments as we could, we considered comments well past the deadline of the comment period. We were trying to speak to comments received as late as June 30th.

MICHAEL JOHNSON: I should add -- thanks Frank -- also that a

number of those 13,000 comments were form comments from a form letter, valuable comments but from a form letter so that counted for some of the volume, 13,000. As we look at those 13,000 comments, approximately 60 or so unique issues raised, and we'll deal with all of those in terms of response to those comments as a part of the rulemaking package going forward on AP1000.

COMMISSIONER APOSTOLAKIS: But you do have to respond to every single one, right?

MICHAEL JOHNSON: Yeah -- well, we will respond to the category of the comments in an analysis in a document that is about an inch and a half thick, two-sided, based on -- to address the staff's response to those comments.

COMMISSIONER APOSTOLAKIS: Now, another question. Maybe it's a clarification. What is the difference between LWA-A and B? Why does B require a DC?

FRANK AKSTULEWICZ: It's just -- it's the material that's the subject of the LWA. The fact that LWA-B required the evaluation of the base mat, it could have been done separately, but because that evaluation is the same evaluation that's necessary to support the base mat review for the design certification, to do those separate was viewed as inefficient and as representation from the applicant. So it was either do that review once or do it twice.

COMMISSIONER APOSTOLAKIS: But is it that in B the applicant now is beginning to work on safety-related structures and components?

FRANK AKSTULEWICZ: Only under LWA-1 does it permit the

construction of any safety-related, if at all. I don't know. That's a question I'd refer back to the applicant in terms of the scope, but I don't recall specifically that there is safety-related work being performed under LWA-1 or A.

CHAIRMAN JACZKO: You can just stand there by yourself.

CHUCK PIERCE: My name's Chuck Pierce. I'm the AP1000 licensing manager for Southern Nuclear. The LWA 1 included backfill, the mud mats, and the waterproof membrane. Though the backfill was described in the early site permit as being a safety-related feature, and so from that point of view, those items were considered important for the -- toward construction, if you will, of the plant, which is part of 50.10, at this part of construction it's an LWA activity.

COMMISSIONER APOSTOLAKIS: Thank you. So -- I'm sorry. There's another comment?

CHAIRMAN JACZKO: If you want to make a comment, come down to the podium.

COMMISSIONER APOSTOLAKIS: You want to make a comment? Go ahead. While the gentleman is coming, so is the fact then that we're waiting for the DCD -- maybe that's our own work -- it's purely for our convenience that we don't want to duplicate an analysis? Is that what you're saying?

FRANK AKSTULEWICZ: It's the choice of the applicant on how to proceed here. So they -- their application, in their application for the LWA-B, they chose to proceed, to wait for the certification in lieu of performing a separate evaluation.

COMMISSIONER APOSTOLAKIS: Oh, thank you.

CHAIRMAN JACZKO: And just to confirm that you have been sworn in.

WHEREUPON,

BRET TEGELER

was called as a witness for the staff of the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

BRET TEGELER: Yes, my name is Bret Tegeler, senior structural engineer, Office of Research. I have been sworn in. The distinction between LWA-1 and 2 with respect to the revision of the certified design, LWA-1 involved the, as you mentioned, the placement of the mud mat and the evaluation of the seismic stability of the nuclear island which really pertained to more of the global parameters such as the shape of the, or the footprint of the nuclear island, the overall mass of the nuclear island. Those parameters did not change between Rev. 15 and 19 now. So for the LWA, we were just looking at the waterproof membrane with respect to the safety-related feature of maintaining a coefficient of friction. The model or design that was referenced was Rev. 15. Staff felt that was appropriate because that design reflected the -- as I said, the more global parameters that remain unchanged.

COMMISSIONER APOSTOLAKIS: So my conclusion is then that both of them involve safety-related SSCs. The difference is the documentation upon which we will rely to make a decision.

BRET TEGELER: Correct.

COMMISSIONER APOSTOLAKIS: Okay, thank you, Mr. Chairman.

CHAIRMAN JACZKO: Mr. Magwood.

COMMISSIONER MAGWOOD: Thank you, Chairman. Michael, this thing is safe, right? Is that your conclusion, your personal conclusion?

MICHAEL JOHNSON: I'm sorry? What was your question, Commissioner?

COMMISSIONER MAGWOOD: Is this thing safe?

MICHAEL JOHNSON: It's safe. It is safe.

[laughter]

COMMISSIONER MAGWOOD: One of the -- the Chairman asked a question about Fukushima Daiichi, and I think there is a broader question I'd like to take from that. This work has gone on for quite some time. And there clearly have been things that have happened, operational experience, Fukushima, there's been earthquakes. There's been lots of things that have gone on in the world while this has been going on. Can you describe, as you're the person who's in charge of this overall activity, can you describe what process your office takes in absorbing whatever lessons learned might be out there and making sure that your work is fully informed by what's happening in the world? Can you describe that, just this --

MICHAEL JOHNSON: Certainly, Commissioner. First of all, we have a very active component of the operating reactors that is engaged in the ongoing operating experience, insights and review as a part of

the Office of Nuclear Reactor Regulation. For example, they are clearing house review of those ongoing issues as they occur to mine those for insight as they relate to our program. Of course, one of the benefits that new reactors have is that they are in fact required to capture -- to consider operating experience, previous operating experience, and that's been captured in terms of our standards, our way in which we review these applications, and the way in which what we approve in terms of the final designs. We do however get in a situation, and like Fukushima, where insights have been gained but final recommendations haven't been decided. And so, that's the situation that we find ourselves in with respect to AP1000 and these COLs. We've taken a look based on the current requirements. They meet the current requirements. We have processes in place to -- when those final actions are decided by the Commission, to apply those to the designs or, if appropriate, to the COLs going forward. So we think we're in a good place with respect to the most recent insights as we move forward.

I guess the other thing I'll note is that we've already gained with respect to the area of seismic, for example, and flooding because the -- because we are a state-of-the-art with respect to those evaluations, and those evaluations -- that state-of-the-art has already been captured in terms of the way that we do the review and in terms of the way that designs have been built or are being built. We've already benefitted, continue to benefit on an ongoing basis in the area of new reactors as we go forward.

COMMISSIONER MAGWOOD: I appreciate that. I was talking with

the applicant a bit earlier this morning about the PAR process and you were sitting there during that. And the PAR -- having this process makes a great deal of sense with a project this large and this complicated. You know there's going to be some changes as we go forward. Some of the changes we have to approve, some the applicant can go forward with without immediate NRC approval. One question I have for you is as you think about how this will transpire over the years, how do we manage those changes in terms of what gets inspected and how they're inspected and what the inspectors know when they're going through the construction process? How do you manage all the changes? Can you give us an overview of that?

MICHAEL JOHNSON: Sure. You want to start?

FRANK AKSTULEWICZ: All right. I'll start. I think one of the benefits of the PAR is that it provides insight to the inspection process for when inspections, if they were planned, would not be performed so they wouldn't be a waste of staff resources where they would have to do -- come back again. That was part of the envisioning of the notification in terms of that particular part of the agency review process.

COMMISSIONER MAGWOOD: Mr. Pierce mentioned that for some of the licenses or some of the changes they anticipate, the PAR process wouldn't even be used. And as I mentioned, for some of the -- there are two changes they don't have to come to us at all in the first place anyway. How -- since that information wouldn't be available up front, how do the inspectors know what's been changing, what's going on? How

do they keep track of that?

FRANK AKSTULEWICZ: There's -- and I'm not a qualified inspector saying -- say that. But there is a process that's involved where, as part of our normal core program, we go out and look at changes that are occurring at like a 50.59-like process that roll up to determine how rigorous the applicant's program or the licensee's program is with respect to making sure that the criteria that are laid out are being met as to when something should be submitted to the NRC and should not. Also, there is a regulatory requirement to update the FSAR on a periodic basis so that this notification comes into the agency and indicates where the changes are being made in the base documents that were not part of an amendment process. And the staff then looks at that and determines whether or not those changes should have been reviewed, number one. And then number two, to build into a process that whether or not to correct the inspection or whatever review activities are appropriate.

MICHAEL JOHNSON: I'm going to, Commissioner, just add a little bit -- I'm thankful for Frank starting off with an answer because, yeah, it's a really -- it's a question that has many tentacles to it. We'll certainly know the things that the licensee want to change at that point, and we'll look at those items. We'll have, as Frank indicated, pre-notice about things that we would -- that would impact our inspection program. The other thing that's important to keep in mind is that we'll have -- we've allotted 35,000 hours of inspection over the course of that construction period. And as Frank alluded to

and the panel can later on provide additional detail on, inspectors will be out looking for changes in terms of things that may have gone through the ISG-11 process and not been provided to the staff as a routine matter. We'll also be looking at all kinds -- all aspects of that construction project as it goes forward. We've got an extensive process and a database to capture findings, and we'll -- and an oversight process that we'll begin piloting in December. So we'll have, from an inspection oversight perspective, another feedback into our overall management of the project so that when we get to the end we're aware of what's been built, what's been constructed and how it compares to what will be approved in terms of the license and the design.

COMMISSIONER MAGWOOD: Excellent. Thank you very much. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Mr. Ostendorff?

COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman. Thank you all for your testimony today. Mike, I found your comments on trying to provide some quantification to the staff's extensive review to be very helpful as far as man hours you're spending for safety and environmental portions of the analysis for the COL. I also agree completely with Commissioner Svinicki's comments on the public nature of these 60 meetings, I understand. I believe that we as an individual commission, I think I've been kept well-informed about the status of the staff's review on this, so I'm grateful for that communication.

For my colleague, Commissioner Apostolakis, I, you know, my initial reaction on the 13,000 public comments is also, well, that

sounds like a lot of comments, but I recall in 2008, the National Nuclear Security Administration was doing a site-wide EIS for transformation of their eight sites, and they received just over 100,000 comments that we're dealing with at the staff level three years ago. So, again, another data point sometimes is helpful for perspective.

I wanted maybe to start out with a comment, I think, Mike you were just making to Commissioner Magwood about the inspection program and so forth. And the previous panel, I'd asked the license applicant what lessons learned have they gleaned so far from the AP1000 construction projects in China, and I know that you and NRO and Region 2 have a construction inspection program, and there's been some rotational assignments to people over to the Sanmen site. Could you comment very briefly, either you or Frank, on anything that you gleaned from that that would help the NRC going forward, looking at the construction if the Commission does approve the Vogtle license application?

MICHAEL JOHNSON: I think, first of all, Commissioner, it has been valuable for us to be able to send inspectors to the Salmon site and for us to see those inspectors here. Some of the kinds of insights we've gained, for example, deal with inspectability. It helps to be able to go look at the site that is being built. They are not using ITAAC in China, but it helps us to, as we look at the ITAAC, gain additional insights about how do we approach, what are our strategies for approaching inspection with respect to individual things that we would be wanting to follow up on related to ITAAC and construction inspection in general. So it's those kinds of insights that we've

captured, brought back, shared at counterpart meetings that we have between Region 2 and NRO and actually captured and incorporated in our procedures.

COMMISSIONER OSTENDORFF: Thank you. I have a question, Robert, for you, associated with a big picture environmental question. The applicant on the previous panel presented a map of the area. And you know, you can't help but notice that right across the river is the Savannah River Site, and albeit in a different state, but it's right in close proximity to the proposed construction site for Units 3 and 4. And I know that your slide 11 talked about the communication with federal, state, and local agencies, and tribes. At a high level, if you look at the Army Corps of Engineers that has activities down there at Savannah River and they also have activities at the Savannah River Site. The Department of Energy that has responsibility for the Savannah River Site -- is the big picture of federal agency alignment on how to look at environmental issues at Vogtle, I'd say, if you use as a reference point how those environmental issues are pursued and evaluated across the river, at the Savannah River Site.

ROBERT SCHAAF: Well, each agency, in conducting its environmental reviews, will include consideration of accumulative impacts of other not only federal actions but other actions in the vicinity of the proposed action. We do reach out to, for example, the Corps of Engineers, federal resource agencies, Fish and Wildlife, National Marine Fisheries, and others to assess the broader area. So I guess that's how I would answer the question, is that, you know, each

agency individually in the course of conducting its activities is looking at the other activities that are taking place, including those.

COMMISSIONER OSTENDORFF: Well, let me just maybe put a finer point on the question. With respect to, again, the high level or the way the NRC team approached the environmental review for Vogtle 3 and 4, any significant philosophical differences in the approach taken by the NRC compared to the approach taken, to your knowledge, by the Army Corps of Engineers or the Department of Energy as they look across the river at how they do business at the Savannah River Site.

ROBERT SCHAAF: I'm not aware of any differences. I don't know if you can expand on it.

COMMISSIONER OSTENDORFF: I don't know -- your slide 11 talks about communicating with other agencies --

ROBERT SCHAAF: Right, right.

COMMISSIONER OSTENDORFF: If there's any significant feedback or maybe there's not much of a feedback. I'm just curious at this point.

ROBERT SCHAAF: Well, I mean, we do reach out to the, like I said, to the resource agencies, to the Corps, to local and state agencies. The draft goes out for an opportunity for all agencies to comment on.

MICHAEL JOHNSON: I'm sorry. Let me just offer -- we'll touch that, if it's acceptable, to the extent that there were any disagreements. And there are none that come to mind. I think the process provides for --

COMMISSIONER OSTENDORFF: And I realize subsequent panels will have it detailed tomorrow, but I was talking about very high level as far as the approach.

MICHAEL JOHNSON: Barry?

WHEREUPON,

BARRY ZALCMAN

was called as a witness for the staff of the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

BARRY ZALCMAN: My name is Barry Zalcman. I'm staff on the environmental side. Let me point out, it's a very good question that you ask. Different federal agencies have different responsibilities. They have organic statues. They have mission responsibilities. The Department of Energy at Savannah River National Laboratory is a facility manager. They actually build. They actually operate facilities. The Nuclear Regulatory Commission evaluates applications. We have a similar situation with TVA as a owner-operator, builder of a nuclear power plant, operator of a nuclear power plant. Their NEPA responsibilities sometimes are living responsibilities. So when the Department of Energy in building an environmental impact statement maintains the currency of that information. Their actions are ongoing. The Nuclear Regulatory Commission, when you decide this action, will complete the federal action. So the environmental impact statement supports the decision you must make. But thereafter, the NRC's work is done until there are changes to the license. If there are amendments, that prompts another

NEPA action. So a regulatory agency has a different role in NEPA then facilities and operators, sister agencies like managing forests, preservation, conservation, consumption, utilization -- they all have different responsibilities. But the NRC as a regulatory agency is very unique in that respect.

COMMISSIONER OSTENDORFF: Thank you. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Did you have --

COMMISSIONER OSTENDORFF: I was just going to comment. I'm really -- I probably didn't frame the question well, and I'll maybe -- let me go ahead and just make a comment and then I'll -- maybe it will be appropriate for me to ask tomorrow at the environmental panel. I appreciate the distinction between the role of the NRC and DOE but if I'm living -- if I'm a public citizen down there living by the, you know, in that area, I look at the federal government as a federal government. Whether it's the NRC or DOE, it doesn't make any difference. I'm just trying to see is there a rough philosophical alignment of the approaches that the two agencies that are -- that have big footprints in that area take. And that's kind of the nature of the motivation for my question. But I'll hold off until tomorrow on that.

MICHAEL JOHNSON: We'll get you a more complete answer. I understand your question. Thank you, Commissioner.

COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Thank. I just wanted to follow up on one point. If we go back to the question and maybe, Greg, maybe this would

be more for you. I just want to get correct -- I think I heard some different information so I want to try and get straight what the staff position is. When it comes to Fukushima and the staff's supplemental EIS, the staff did consider this as new information and determined it not to be significant? Is that the correct -- my correct understanding?

WHEREUPON,

GREGORY HATCHETT

was called as a witness for the staff of the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

GREGORY HATCHETT: Yes, yes, Commissioner, I mean, Chairman. Yes, sir, we did. It was new information, but it wasn't significant. We looked at the task force report, and then with respect to severe accident analysis, when the environmental review, we looked back to the design certification in the COL to see what is changed in response to that because we don't do anything different with respect to severe accident than they do on the safety side in terms of the components. So we're looking at the same thing. They didn't change. We didn't see a need to proceed because nothing changed.

CHAIRMAN JACZKO: So there -- so this was looked at as new but determined not to be significant. The -- and just walk me through one more time. I'm confused why the safety side is relevant. I mean, let's say if we in three months, or let's say in six months, the Commission imposes regulatory requirements that require a modification to a facility because, you know, we're concerned that the accident

consequences may be more significant. There's no going back for the NEPA. I mean, we -- and I think, as Barry did a nice job explaining, the NEPA is tied to the license issuance. So once the license is issued our NEPA responsibilities end. Well, in the safety space, we can go and impose new regulatory requirements. We can't go back and impose a new environmental requirement. So I'm not understanding why this wasn't significant information.

GREGORY HATCHETT: It depends. Because what happens is, depending on the form that the Commission decision takes in terms of any future action to impose different requirements, how the staff will implement that may require further NEPA review for that particular action because that will be an action -- federal action of the Commission being taken with respect to new requirements. So if it, for instance, it's an amendment, right, then you would have three potential NEPA actions you could take: categorical exclusion, an EA, or an EIS, depending on the level of impact that could be caused as a result of the action that the Commission wanted to take at a nuclear facility.

CHAIRMAN JACZKO: But the licensing action is done?

GREGORY HATCHETT: Yes.

CHAIRMAN JACZKO: So the staff's position is that there is not significant information from a NEPA perspective relative to Fukushima Daiichi from a current licensing perspective?

GREGORY HATCHETT: At this time.

CHAIRMAN JACZKO: At this time.

GREGORY HATCHETT: Because there had been changes that would

require the staff to go back and relook as to what we would have to do in response to some change. We haven't seen a change in requirements, a change in accidents, and change in the design that will require us to go back and reconsider anything to determine whether or not, assuming it is significant, then determining whether or not it would change the conclusions that were reached in the supplemental environmental impact statement.

CHAIRMAN JACZKO: Okay. I'm not -- we'll probably have an opportunity to explore this some more tomorrow. Any other comments or questions from any of my colleagues? Okay, thank you very much. We'll take a quick five-minute break.

(Whereupon, a short recess was taken)

CHAIRMAN JACZKO: Okay, we will now reconvene. I'll start with our first safety panel. I'll note for the remaining panels the applicant is expected to discuss the contents of the COL application, they'll have 15 minutes for that, while the staff is expected to discuss their regulatory conclusions and the review process. Each panel should include a discussion of site specific ITAAC or other licensing conditions associated with the subject matter of the panel.

Our first safety specific panel with focus on the first three Chapters of the safety evaluation report and the relevant section of the application.

And I would just remind anybody who is coming to the podium to speak, if they can remember to state their name and whether or not they've been sworn in, if they've not been sworn in then we'll have to

go through that process, so people can just remember to do that. So, if all the people seated at the table could please state their name and title for the record.

WHEREUPON,

WESLEY SPARKMAN

AMY AUGHTMAN

EDDIE GRANT

were called as witnesses for Southern Nuclear Operating Company and, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:

WESLEY SPARKMAN: I'm Wes Sparkman, I'm the COL licensing supervisor for SNC Vogtle Units 3 and 4.

AMY AUGHTMAN: Amy Aughtman, Southern Nuclear AP1000 licensing supervisor.

EDDIE GRANT: Eddie Grant, AP1000 Licensing Support Lead for NuStart.

CHAIRMAN JACZKO: And let's have the staff as well, we'll do this once and then --

WHEREUPON,

RAVINDRA JOSHI

DENISE MCGOVERN

MOHAMED SHAMS

were called as witnesses for the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:

RAVINDRA JOSHI: Hi, my name is Ravindra Joshi, I'm Senior Project Manager with Office of New Reactors.

DENISE MCGOVERN: Denise McGovern, project manager, NRO.

MOHAMED SHAMS: Mohamed Shams, acting branch chief for structural engineering in NRO.

CHAIRMAN JACZKO: Thank you, okay. We'll start with the applicant.

WESLEY SPARKMAN: Thank you. As you said, this first panel discusses selected items from Chapters one, two, and three of the combined license application final safety analysis report for Vogtle Units 3 and 4.

Next slide please. I will begin by covering a request for licenses associated with 10 CFR Parts 30, 40, and 70 -- next -- Amy will discuss Vogtle site characteristics and the water proof membrane departure, and finally Eddie Grant will cover examples of key safety information incorporated by reference from the AP1000 design control document.

Next slide please. Part one of Vogtle's combined license application included a request for Part 30, 40, and 70 licenses to allow receipt, possession, and use of by-product, source, and special nuclear material. Because there was no specific guidance provided for Part 52 COL applicants, the information needed to be provided in the support of materials licenses, SNC did not identify the information specifically needed to support the staff's review in the initial submittal. In response to staff requests for additional information provided over the

past year or so, it became apparent that much of the information needed for the staff's review was in fact included throughout the various Parts of the COLA. For example, radiation protection details were provided in FSAR Chapter 12, including the radiation protection program description in Appendix 12 Alpha Alpha, the physical security details were provided in the physical security plan in COLA Part eight, fire protection program information was provided in FSAR Chapter 9, and training and procedures information was provided in FSAR Chapter 13.

However, the staff's review also identified several elements that needed to be clarified or enhanced to support their review of material license applications. These included a description of a program to address control and accounting of special nuclear material to meet the requirements of 10 CFR Part 74, a description of a program to address new fuel receipt and storage prior to establishing an operational protected area to meet the requirements of 10 CFR 73.67, a plan for procedures and instructions to address transfer of control of new fuel to a qualified shipper, in other words, one with a approved transportation security plan, in the event that new unirradiated fuel needed to be returned to the manufacturer to meet the requirements of 73.67, Golf 1 through Golf 3. Also limitations on the types, form and quantities of byproduct, source, and special nuclear material to be received on site, especially during the period preceding the Commission's 10 CFR 52.103(g) finding.

In addition, this includes restrictions on receipt of any quantities of uranium hexafluoride at any time on the Vogtle site. Next

slide please.

To support approval of the material control and accounting program description, Southern Nuclear also requested an exemption from certain requirements in 10 CFR Parts 70 and 74. Approval of this request will extend the applicability of Part 50 exceptions to these regulations such that the exceptions are equally applied to the Part 52 licensees. The basis for this exemption request is that the requirements under the consideration are applicable to fuel cycle facilities as opposed to utilization facilities and there is no technical or regulatory basis to treat Part 52 licensees any different than Part 50 licensees in this respect.

Following satisfactory completion of the staff's review of Vogtle COL application the staff developed Interim Staff Guidance, ISG-23, clarifying the information to be provided in support of future COL applications. A review of this draft guidance confirmed that the information needs identified in this guidance have now been provided to the staff or addressed in commitments and license conditions for the above described materials programs. As discussed in SECY 11-0110, several license conditions are proposed to address implementation of the key nuclear material programs and controls on the nuclear materials described in the previous slide. SNC has reviewed the requirements specified in these proposed license conditions and is prepared to implement the Part 30, 40, and 70 licensees in accordance with these regulations.

Next slide please. I will now turn over the presentation

over to Amy Aughtman to discuss Vogtle site characteristics.

AMY AUGHTMAN: Chapter two of the FSAR presents site characteristics. For the Vogtle COL application the majority of these are incorporated by a reference from the Vogtle early site permit, site safety analysis report, and were resolved in the ESP proceeding. Now, I would like to distinguish between use of the terms resolved and bounded, on this slide and in this discussion. The intent of this slide is to provide a high level snapshot where we were when the ESP was issued. Each site characteristic that was provided at the ESP phase was actually bounded by the corresponding DCD site parameter, however there were a few site characteristics that were not provided at the ESP phase and therefore were not resolved in the ESP phase.

Additionally, there are a couple of site characteristics that, while they were determined be to be bounded at the ESP phase, have now been supplemented or re-determined at the COL phase due to changes in the DCD site parameters themselves. Any characteristics that were previously resolved at the ESP phase that were not modified during the COL application review are then considered to be both resolved and bounded. Our application development process considered DCD changes that impacted any portion of our COL application, and specifically here, including the manner in which site characteristics should be defined or compared. The parameters provided on this slide and the following slide are not a comprehensive listing of the parameters, but do provide the categories of those parameters.

Of the categories shown on this slide there are three

characteristics that were not fully resolved within the ESP proceeding. The first of these was the maximum and minimal normal air temperatures. While the site characteristic values for these parameters were calculated at the ESP phase, they were calculated based on the DCD revision 15 parameter definitions. Those definitions were revised during the DCD amendment process to reflect industry practice and terminology, and we updated our site characteristic determinations to allow for an appropriate comparison. This is characterized in variance 2.3-1.

The second characteristic that required additional work at the COL phase are the atmospheric dispersion values. The information regarding the site boundary and low population zone atmospheric dispersion values were provided at the ESP phase and found to be acceptable for the ESP. However, an ESP permit condition was created to require that if a COL application referencing the ESP and also a certified design, would require that the COL applicant to demonstrate compliance with the radiological consequences evaluation factors by demonstrating that the site-specific atmospheric dispersion values determined in the ESP fall within those evaluated in the approval of a reference certified design. This permit condition was fulfilled by carrying forward the bounded site boundary and low population zone atmospheric dispersion values and by providing the control room atmospheric dispersion values for the DCD-identified release points.

The third category from this slide that was also determined at the COL phase is with respect to water level. At the ESP phase we

did establish the design basis river flood level, and that was considered resolved. However, the other element to water level is maximum local, probable maximum precipitation flood, also known as local intense precipitation, and that was determined and established at the COL phase. Next slide.

This slide shows the soil and seismic related characteristics that were primarily resolved at the ESP phase as well. There is one seismic parameter that was supplemented at the COL phase to provide a more detailed evaluation demonstrating the in-structure response spectra is bounded by the DCD's certified seismic design response spectra site parameter. This characteristic comparison will be discussed in additional detail in safety panel two. As you can see, minimal additional information was necessary to be provided at the COL phase for site characteristics due to the majority of those being resolved at the ESP phase. Next slide.

One of the special topics requested for this panel was the water proofing membrane departure. This departure exists because the DCD does not describe the water proofing option that was selected for use at Vogtle 3 and 4, and that had been reviewed and approved at the ESP phase to support the LWA, we call it Alpha request, others refer to it as One. While the Vogtle design is not specifically described in the generic DCD, it is consistent with the DCD design. This design feature does have a site specific ITAAC, which will confirm the specified coefficient of friction of 0.7. And now Eddie Grant will cover the next slide on DCD key safety information.

EDDIE GRANT: Thank you, Amy. Chapter three describes the design of structures, components, equipment, and systems. This information is primarily within the scope of the certified design control document, and thus provided in the DCD, and incorporated by reference into the combined license application, final safety analysis report, in the corresponding sections of Chapter 3. The COLA FSAR does provide some supporting information on the site-specific systems and site related aspects of the DCD systems, as well as some programmatic information such as in-service testing and equipment qualification.

Some of the key information incorporated by reference would include the information related to the nuclear island structures, including, for example, the shield building redesign to support the related regulation revisions. Much of this shield building information has been included in the DCD in Sections 3.7, Seismic Design, and in Section 3.8, Structural Design, and then in any associated DCD Chapter three appendices. These sections describe the structure and its functions, as well as the methodology used for the design of the structure. These sections are incorporated by reference into the COLA at FSAR Sections 3.7 and 3.8.

There are also several ITAAC associated with the nuclear island structures and these are included in the DCD again, in Tier 1, in Section 3.3, and there are some associated DCD Tier 1 figures, 3.3-1 through 10 that show some specific details. These have been identified to be included in the license as proposed by the staff SECY COL attachment.

Another key example, on the next slide, of information in Chapter 3 is general information related to the design of various safety systems and their safety evaluations, including, for example, the vacuum relief system and the containment pressure evaluation. However, the details of these systems, the vacuum relief system in particular, is discussed in detail in the DCD in Chapter 9 and incorporated by reference again into the COLA FSAR in section 9.4.7. The containment pressure evaluation is also discussed in detail in the DCD in Chapter 6 and is incorporated by reference at the COLA FSAR Section 6.2. The results are also included for this containment pressure evaluation in the DCD generic tech spec 5.5.8, which identifies the containment leak rate testing program. And this tech spec is also included in the Vogtle plant specific tech specs. And that concludes the applicant panel one discussions.

CHAIRMAN JACZKO: Well, thank you. We'll have the staff come to the table and give their presentation.

RAVINDRA JOSHI: Good morning, my name is Ravi Joshi and I'm a senior project manager with the Office of New Reactors. I've been working as a lead safety project manager under Vogtle COL application since April of 2009. I've been heavily involved in the development and coordination of the final safety evaluation report, FSER, for Vogtle Electric Generating Plant reactor, I will call Vogtle Units Three and Four. For the Vogtle application our work has included the use of various parts of the Vogtle application including the final safety analysis report, that is FSAR numerous requests for additional

information, face-to-face meeting between NRC staff and the technical representatives. I also have with me my colleague, Denise McGovern, project manager who has been instrumental in supporting the development of the FSER. She'll be presenting several chapters during the course of today's presentation and tomorrow's presentation. For this panel I'll be representing Chapters 1 and 2, Chapter 3 will be presented by Denise McGovern and Mohamed Shams, who is sitting next to me, acting branch chief, Structural Engineering Branch. Next slide please.

We'll be presenting the staff review of the FSAR Chapter 1 -- slide number 3. The application consists of 11 parts, presented in next two slides. Part one, general and administration, includes the financial information and the staff review is included in section 1.5.1 of the Final Safety Evaluation Report, FSER, for the application. We'll be discussing the staff review in this topic later. This table describes where the staff's evaluation of each part of COL application appears within either the FSER or the final supplemental environmental impact statement, that is FSEIS. For example, the staff evaluation of limited work authorization, request number two, is included in the FSER Section 3.8.5. Now, please go to slide number five.

Part 2 of the application is FSAR. This table identifies whether information contained in this section is incorporated by reference IBR, standard content, or site-specific, or supplemental information to standard content. Next slide please.

For example, Section 1.9, Compliance with Regulatory Criteria, indicates that information contained in this section is IBR

with standard and site-specific supplements. Compliance with a certain Reg. Guide is resolved as a result of referencing the AP1000 DCD, that is IBR, while compliance is either addressed via standard content applicable to all the AP1000 COL applicants, which would refer to throughout our presentation as standard content, all this specific to Vogtle COL, which would be same as plant-specific. Next slide please.

Staff evaluated three exemptions from NRC regulations requested by the applicant and found them acceptable. The exemptions are identified in this table. The exemption related to special nuclear material referred to as SNM, Material Control and Accounting program, also referred as MC and A is evaluated in FSER Section 1.5.4. I'll be discussing the staff's review of the exemption request later. Next slide please.

The staff evaluated applicant's proposed six departures from tier 2 information in AP1000 DCD revision 19, presented in this table and found them to be acceptable, but some of the application describes and justifies the departure. It also evaluates each departure against the criteria in Appendix D to 10 CFR Part 52. The departure related to the voltage regulating transformer is evaluated in FSER Section 8.3. Departure related to technical support center is evaluated in Section -- FSER Section 13.3. We'll be describing those evaluations later. Next slide please.

The staff requested six variances from the ESP, as shown on this table. The staff evaluated each request and determined that alternative information supplied by the applicant was acceptable. Part

7 of the application describes the variances in detail. The variance related to updated climatological data is evaluated in the staff's FSER Section 2.3 and will be discussed in our presentation on Chapter 2. Next slide please.

In the next few slides, I will present results of the staff's review of selected technical topics. These results are documented in Chapter 1 of the FSER. I will summarize the staff's review of financial and technical qualifications; the applicant's request for exemption to SNM, MC and A; and the applicant's request for material license under 10 CFR Parts 30, 40, and 70. Next slide please. Staff reviewed information provided by SNC in Chapters 1 and 17 of the FSAR, about the applicant's technical qualifications. The review included an evaluation of operating experience, and Quality Assurance, or QA, program of SNC. SNC has over 30 years of experience in the design, construction, and operation of nuclear generating plant. SNC currently operates nuclear plants at its Hatch, Vogtle and Farley sites. SNC also holds Part 50 licenses for these plants and has demonstrated the ability to choose and manage the oversight of nuclear steam supply system vendors, architects and engineers, and constructors of nuclear-related work.

The staff reviewed the QA program found it acceptable, as documented in FSER Section -- Chapter 17. Based on the staff's evaluation of SNC's experience with nuclear power plants and its QA program, the staff concludes that SNC is technically qualified to hold combined licenses for Units Three and Four. Next slide please.

The staff reviewed information about applicant's financial

qualifications. The review included an evaluation of financial qualification, decommissioning funding assurance, foreign ownership, and nuclear insurance and indemnity. The staff evaluated information about the total construction costs of Units Three And Four. The staff also reviewed funding sources for each of the Vogtle owners. Applicable regulations and the guidance considered by the staff include Part 140, 52.97(a)(1)(iv), 50.33 and NUREG1577.

Based on the staff's evaluation of the financial information provided by the applicant, NRC staff concludes that the four owners and the operators, that is SNC, of Units Three And Four have demonstrated that they possess or have reasonable assurance of meeting estimated construction costs as well as decommissioning funding assurance. Therefore the staff concludes that the applicant is financially qualified to construct and operate Units Three and Four and engage in activities authorized by the combined licenses. Next slide please.

The provisions of 10 CFR 70.22(b) require an application for license for Special Nuclear Material to include a full description of the applicant's program for the MC&A of SNM under 10 CFR Part 74, likewise 10 CFR 70.32(c) requires a license authorizing the use of SNM to include a condition requiring the licensee to maintain and follow the SNM MC&A program. However, the applicable regulations include exception for nuclear reactor licensed under Part 50.

The applicant requested an exemption from these requirements. The applicant stated that the purpose of this exemption request is to seek similar exception for this COL under Part 52, such that the same

requirements will be applied to its SNM MC&A program as to the reactor license under Part 50. The next slide please.

The criteria for granting the subject exemptions are included in several NRC regulations, including in Part 70 and 74, such as 70.17(a), 74.7. In addition pursuant to 10 CFR 50.7, the Commission may, upon application by an interested person or upon its own initiative, grant exemptions from the requirements of Part 52.

10 CFR 52.7 further states that the Commission's consideration will be governed by 50.12, which states an exemption may be granted when the exemptions are, one, authorized by law: will not present an undue risk to the public health and safety, and consistent with the common defense and security; and two, when special circumstances are present. The special circumstances are present whenever "Application of regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose rule."

Recognizing the appropriateness of treating the MC&A program of both Part 50 and Part 52 licensees consistently, the staff determined that this requested exemption meets all the criteria of 50.12 that I just described. The staff considers that this request also demonstrates that exemption criteria in 52.7 and other related exemption criteria are satisfied. Therefore the staff finds exemption is justified. Slide 15.

As part of the COL application, SNC also requested material licenses for receipt, possession, and use of by-product, source, and Special Nuclear Material, also referred to as Part 30, 40, Part 70

respectively.

This 30, 40, 70 review was a first-of-a-kind review, for an application in Part 52 licensing process. The staff coordinated this review with other NRC offices. These other offices routinely review applications for 30, 40, 70 licenses. They are the Office of Nuclear Material Safety and Safeguards, Part 70; the Office of Federal and State Materials and Environmental Management Programs; and NRC Region One, for Parts 30 and 40; and the Office of Nuclear Security and Incident Response for Security and Emergency Preparedness Requirements applicable to Part 30, 40 and 70.

The staff's review confirmed that some the key information requirements under Part 30, 40, and 70 were made by information previously submitted by SNC to meet Part 52 requirements. In particular, Part 52 information pertaining to the radiation protection, fire protection, emergency planning, and non-licensed staff training, including the operational programs for those areas were directly applicable to the licensing requirements of what -- Parts 30, 40, and 70. Next slide please.

The applicant provided information regarding specific types of sources and by-product material, the chemical and physical form, and the maximum amount of the material at any time, for requested material licenses for under Parts 30 and 40. By-product material and source material should be in the form of sealed neutrons sources for reactor startup, sealed sources for reactor instrumentation, and radiation monitoring equipment calibration. The applicant also committed that no

Part 40 specifically licensed source material including natural uranium, depleted uranium, uranium hexafluoride, that is UF6, would be received, possessed or used during the period between issuance of COL and the Commission's 10 CFR 52.103(g) finding for each of the Vogtle Units Three and Four. In addition, SNC committed that UF6 would not be received, possessed or used even after the 52.103(g) finding, that is during plant operation.

SNC provided sufficient details of the operational programs such as radiation protection program, fire protection program, and non-licensed staff training program, to support Parts 30 and 40 material licenses. These operational programs are required by regulations. Vogtle FSAR Table 13.4-201 lists each operational program, the regulatory source of the program, the section of the FSAR in which the operational program is described and associated implementation milestones. Next slide please.

For the Part 30 and 40 reviews, the staff used portion of the NUREG-1556 as guidance. Part 52 information pertaining to radiation protection, fire protection, emergency planning, and physical security and associated operational programs was directly applicable to licensing requirements of Parts 30 and 40. This aspect of review is discussed in Section 1.5 of the staff's FSER.

The applicant stated that no by-product material would be received, possessed, or used of a physical form that is unsealed, on foils or plated sources, or sealed in glass, that exceeds the quantities of Schedule C of 10 CFR 30.70. Since the contents do not exceed

Schedule C, emergency plans that meet the requirements of Part 30 are not required.

Similarly, the applicants request for a Part 40 license state that no Part 40 specifically-licensed source material will be received, possessed, and used during the period between the issuance of the COL and 52,103(g). Since the above quantities are not exceeded during this time, an emergency plan is not required.

The key element of the staff review is to ensure the presence of appropriate controls on the sources and material during construction, that is prior to fuel load. Therefore, the draft license include license conditions that establish controls in the form of limits of a type and quantity of materials that licensees may possess prior to the 52.103(g) finding, after the 52.103(g) finding. The requirements of these sources and materials are met by the controls in place for operation. Next slide please.

SNC provided information regarding Part 70 material, SNM, as nuclear fuel, by referencing specific Vogtle FSAR Section. These sections included information regarding general financial information and site description; organization and administration; radiation protection; nuclear criticality safety; and fire protection. It also referenced sections of the FSAR regarding emergency preparedness; environmental protection, MC&A program for SNM; physical security plan. Next slide please.

Part 70, Safety and Security Reviews, the staff utilized portions of NUREG-1520 and NUREG-0800. For the reason described in

section 1.4 of the FSER the staff agrees that applicant is technically qualified to engage in the proposed activities. The finding is based on the applicant's ongoing experience in the safe operation of the nuclear power plants as described in section 1.4 of the Vogtle FSAR. Likewise, the applicant's financial qualification and ownership structure meet the requirements of Part 70.22 for the same reasons described in the staff's FSER Section 1.5, with respect to the COL as a whole. Similarly, the applicant has explained how the anticipated amounts, types, and uses of Part 70 material at this site are consistent with the provisions of Part 70.22.

In addition, the Vogtle FSAR provides information regarding regional hydrology, geology, meteorology, nearby population and potential effects of natural phenomena that could occur at the facility. The applicant has described the responsibilities and associated resources for the receipt, possession, and inspection and storage for the Part 70 material. Therefore, it meets the requirements of 10 CFR 70.22(a)(1).

As indicated in Vogtle FSAR 13.4-201 applicable portions of Radiation Protection Program will be implemented prior to initial receipt of byproducts, source, or SNMs. The Radiation Protection Program is in accordance with the NRC-approved template, NEI 07-03A, which is incorporated by reference into Vogtle FSAR. The appropriate radiation protection program elements will be in place prior to initial receipt of by-products, source, or special nuclear materials.

Staff also concluded, based on the information included in

Vogtle FSAR section 9.5, that capabilities of the fire protection program and the fire protection equipment servicing this area are sufficient to meet the requirements of 10 CFR 70.22(a)(7) and a(8).

Finally, the applicant will be storing new fuel racks, stored dry, on the spent fuel racks prior to loading into the reactor. The safety analysis included an AP1000 DCD Section 9.1 indicates that criticality evaluation meets the requirements of 10 CFR 50.68(b). Therefore, the criticality accident alarm system is not required. As a result, an emergency plan is also not required, while the fuel is stored on-site prior to being loaded into the reactor. Next slide please.

The applicant described MC&A programs and stated the program be developed in accordance with the applicable requirements of Part 74, subparts A and B. This program will be consistent with relevant guidance of American National Standard Institute, ANSI, 15.8 2009.

In order to address the applicable Part 74 requirements, prior to operation the applicant proposed that this program would be an operational program, it would be implemented prior to receipt of nuclear fuel on site. Implementation of the program prior to receipt of fuel will also address the possession and storage requirements of SNM during construction and prior to operation. This program will remain in effect until the SNM is shipped from this plant site.

The staff finds the applicant MC&A program for SNM is consistent with ANSI 15.8, meets reporting and recordkeeping requirements of Part 74. The applicant documented how it meets the applicable requirements of material accounting and control consistent

with Part 74. In addition, the staff is proposing a license condition that requires a schedule to support NRC's inspection for the MC&A program for the SNM. This is consistent with the policy established in SECY 050197. Next slide please.

Pursuant to requirements of 10 CFR 73.67, the applicant provided a physical security plan, referred to as PSP, regarding the protection of new fuel, as SNM, at the Vogtle site, prior to declaration of an operational protected area, or PA, and implementation of the requirements of 73.55. This plan includes transportation security provisions. It also considers the ability of the substantive provisions of interim compensatory measure orders, or ICMOs, that were issued to Category III Fuel Cycle Facilities to ensure adequate protection when SNM is on site, prior to activation of the PA.

In addition, the applicant revised Section 13.5 to include new fuel shipping plan. This plan addresses the applicants Part 73.67 requirements in the event that unirradiated fuel assemblies or components are returned to the supplying fuel manufacturer's facility. The New Fuel Shipping Plan summarizes the procedures and written agreement that applicant will have in place prior to shipment of new fuel back to the manufacturer.

The NRC staff reviewed the applicant's PSP for fixed site physical protection of SNM of Low Strategic Significance and chemicals of concern. The methods and procedure outlined in the PSP satisfy the performance objectives, system capabilities, and reporting requirements specified in Part 73.67. The PSP for the facility is acceptable and

provides reasonable assurance that requirements for the physical protection of SNM of low strategic significance and chemicals of concern will be met. In addition, staff found the new fuel shipping plan acceptable because it meets the applicable requirements of 10 CFR 78.67(g). Slide number 22.

The staff found the SNC satisfies applicable requirements of Parts 30, 40, and 70. A key element of the staff review was to ensure the presence of appropriate controls on the sources and materials before and after 52.103(g) finding. Therefore, staff has proposed license condition authorizing SNC to receive, possess, and use Parts 30, 40, and 70 materials. These conditions are identified in the staff's FSER as well as in the draft license attached to the staff's SECY information paper.

In addition, the staff has determined that SNC's application is expected to be standard for other remaining AP1000 COL applicants and the staff's evaluation is expected to constitute a standard review for the AP1000 COLs. In the remaining AP1000 COL reviews only plant specific differences between RCOL, Vogtle, and SCOLs will be addressed separately. That concludes my Chapter 1 presentation.

I will continue with the presentation for Chapter 2. Slide number 24. I will present a summary of safety aspects of the ESP and LWA number 1, that were reviewed previously by the staff and, and resolved in the ESP proceeding, but are discussed here to provide context for the COL review.

I will also present a staff review of the Chapter 2 of the

Vogtle FSAR. Specifically I'll provide background information regarding the AP1000 design and the ESP as it relates to the COL application. In addition I will present an overview of the applicant's submittal regarding the Vogtle site-related topics. The next slide please.

Part 2 of the Vogtle ESP application, revision 5, consisted of a site safety analysis report on SSAR, which provided complete and integrated information for the Vogtle site which NRC staff reviewed. In August of 2009 the NRC issued the ESP for the Vogtle site.

The staff review on all safety issues associated with the ESP application and the LWA request is documented in NUREG-1923, the staff's ESP FSER. The staff's evaluation included a technical review of the information and data the applicant submitted, with emphasis on the topics listed on the slide. This includes, for example, potential hazards of the nearby facilities including hazards at Vogtle Units One And Two, as well as transportation accidents.

10 CFR 52.39 generally states that the Commission shall treat as resolved those safety matters resolved in the ESP, except that COL applicant needs to update the emergency preparedness information that was provided with the ESP application.

Part 3 of the Vogtle ESP and COL application consisted of environmental reports. These reports described the environmental impacts of constructing and operating new units at the Vogtle site. The staff's review of the environmental issues associated with the ESP and COL applications is scheduled to be discussed tomorrow. Next slide.

The staff's SER for ESP also documents the technical

evaluation of the applicant's LWA request, LWA number one. The staff's evaluation included a technical review of the information and data the applicant submitted with emphasis on the following matters: the acceptability of design properties related to the engineered backfill, the acceptability of the mud mat and waterproof membrane, the Quality Assurance requirements, and the Fitness For Duty program. The next slide please.

In the next few slides I will present a summary of the staff's evaluation of Chapter 2. Consistent with the 10 CFR 52.83, the staff review of the COL application was limited by the scope and nature of the matters resolved in the previous ESP application and the AP1000 DC rule and included those area associated with the COL applicant's referencing of the Vogtle ESP application, Site Safety Analysis Report, and the AP1000 standard design certification.

Staff reviewed the resolution of ESP permit condition 9, variances, departure 2.5-1, and the AP1000 COL information and action items. The next slide please.

This table identifies the information contained in each section of the Vogtle FSAR Chapter 2 is IBR, standard, site specific or supplemental information to standard content. For example, Section 2.2, nearby industrial transportation and military facilities contains IBR, standard, and plant-specific information. A discussion related to potential hazards from chemicals stored onsite at an AP1000 plant is applicable to all AP1000 COL applicants and is therefore standard plant information. A discussion related to potential hazards due to other

chemicals stored on site at Vogtle or near the Vogtle site is plant-specific information. Next slide please.

Staff reviewed and compared the Vogtle site-specific characteristic values presented in a Vogtle FSAR against the AP1000 site parameters presented in the AP1000 DCD. Note that most of the site characteristic values were reviewed and approved as part of ESP. The staff review confirmed that the AP1000 site parameters were enveloped by corresponding Vogtle site characteristic values. One exception was Vogtle ground motion response spectra, GMRS, which is expected -- which exceeded the AP1000 DCD certified seismic design response spectra, that is CSDRS. The evaluation of exceedance will be discussed in the Chapter 3 presentation. Slide 30.

The applicant provided an evaluation of potential hazards to Vogtle's Units 3 and 4 control rooms due to an accidental release of various AP1000 standard chemicals, and other chemicals stored on-site at Unit 3 and 4, as well as hydrazine from storage tanks located at Unit 1.

The staff reviewed the applicant's evaluation of AP1000 standard chemicals and assessed whether any of these chemicals needed to be evaluated further. The assessment was based on information provided in the FSAR, confirmatory analysis, and review of responses to the requests for additional information. The staff concluded that two standard chemicals, hydrazine and carbon dioxide, could exceed IDLH concentration limits outside the control room.

The staff also evaluated potential hazards to the Units Three and Four control rooms, due to an accidental release of site-specific

chemicals stored at Units 3 and 4, as well as accidental release of hydrazine from storage tanks located at Unit 1. The staff concluded that two site specific chemicals, MPA and ammonium bisulfate could exceed IDLH concentration limits outside the Units 3 and 4 control room, but an accidental release of hydrazine stored at Unit would not threaten control room habitability for Units 3 and 4.

Those chemicals found to have a potential to exceed IDLH concentration outside the Unit 3 and 4 control rooms were further evaluated for control room habitability in Section 6.4 of the staff's FSER.

Next slide, please. In the ESP SSAR the applicant identified one percent annual exceedance temperature values as appropriate site characteristics for comparison with the AP1000 normal temperature site parameter values versus AP1000 DCD values. In its ESP review staff found these proposed values to be acceptable. Staff also evaluated 0.4 percent annual exceedance site temperature values proposed by the ESP applicant and found those proposed temperature values to be acceptable as well.

In revisions to AP1000 DCD, which were issued after the Vogtle ESP was issued. Westinghouse clarified that AP1000 normal temperature site parameter values are based on one percent seasonal exceedance frequency. The one percent seasonal exceedance values are approximately equal to 0.4 percent annual exceedance values and therefore more conservative than one percent annual exceedance values.

As a result of this clarification provided by Westinghouse in

revisions to the DCD, the applicant proposed a variance from the Vogtle ESP normal air temperature site values in the Vogtle FSAR.

Because of the proposed site temperature values were already evaluated and found to be acceptable as part of the staff's review of the Vogtle ESP, and because of the revised site values remain bounded by the AP1000 normal temperature site parameter values, the staff found the variance to be acceptable. I'd like to ask Denise to continue the presentation to chapter three.

DENISE MCGOVERN: Thank you. Good morning again. I'm Denise McGovern, a project manager in the Office of New Reactors. In the next few slides we will present a summary of the staff’s evaluation of Vogtle FSAR chapter 3, which is design of structures, components, equipment and systems. Next slide, please. One more, yup. Thirty-three. Thank you.

The table on the following two slides gives an overview of the Vogtle FSAR chapter 3. It identifies whether the information contained in the section is IBR, standard, site-specific or supplemental information to standard content.

Next slide, please. For example, in section 3.8, Design of Category 1 Structures, a discussion related to construction and inspection procedures could be applicable to all AP1000 COL applicants. That is standard. In that same section, the discussion related to the limited work authorization work activities is specific to the Vogtle COL and plant specific. Also in 3.8 is a discussion on the waterproof membrane departure, which I will present in a moment.

To provide context for this chapter, two design issues associated with

the AP1000 will make a more selective for further discussion. They are the shield building and containment vacuum relief system. The COL topics of interest are seismic design, limited work authorization number two and squib valves. These will be discussed in panel two. Mohamed will now continue with the discussion of the AP1000 shield building design.

MOHAMED SHAMS: Good morning [inaudible]. I'm sorry. Now I'm on. I'm the acting branch chief for the structure engineering branch responsible for the review of the structural aspects of the AP1000 DCD. Over the next two slides, I will try to provide an overview of the AP1000 shield building design, the staff's review and our regulatory finding. The shield building, circled in the slide, slide 35, is a safety related seismic category one structure that provides structural and radiological shielding for the containment vessel and radioactive systems located in the containment building. Protects the containment from external events, including missiles, tornadoes and seismic events, provides radiation shielding from nuclear materials and containment, supports the passive containment cooling water storage tank or PCCWS tank, and provides for natural air circulation cooling for the containment vessel.

Next slide, please. The shield building design was revised from reinforced concrete to a steel concrete composite, or SC structure, to improve its resistance to aircraft impact. As part of its review, the staff evaluated the shield building's capability to resist design basis demand such as seismic, tornado and wind loads. Given the unique

construction of the shield building, there was extensive analysis and testing by Westinghouse and an extensive staff review, including consultants. The aircraft impact resistance was examined by the staff through multiple inspections. The staff notes that the design of the shield building in the AP1000 is unique in the fact that it is the first U.S. nuclear use of steel, concrete composite modules. Also, the shield building has a unique design function in its support of the PCCWS tank. The PCCWS tank holds more than three million kilogram or 6.7 million pounds of emergency cooling water. This water load accounts for a considerable portion of the load on the roof of the shield building. The shield building is separate from the steel containment and consists of a cylindrical wall that supports both the conical roof and the PCCWS tank. The shield building wall is constructed with both conventional reinforced concrete with an auxiliary building and new SC wall modules exterior to the auxiliary building. The SC wall modules constitute about 75 percent of the shield building structure. The SC module consists of two steel face plates with concrete infill contained within.

Sheer studs anchor the concrete to steel face plates and tie bars connect the two outer face plates together. The shield building roof, a reinforced concrete structure, is supported on steel beams and is connected to the cylindrical wall by steel ring girder and also called tension ring. The auxiliary building roof and external walls are connected to the SC cylindrical portion of the shield building. The floor slabs and interior structural walls of the auxiliary building are also structurally connected to the reinforced concrete cylindrical

portion of the shield building.

There were two topics related to the shield building required additional information in revision 19 of the AP1000 DCD. Those are the load combinations related to thermal and seismic loads and the revision of the seismic analysis method for the PCCWS tank. Both issues were reviewed by the staff and found to be adequately addressed by Westinghouse in revision 19. In terms of the overall shield building review by the staff, recognizing its first-of-a-kind nature, the staff conducted a careful review of the unique and complex design of the shield building. To ensure that under design basis loads, including the safe shutdown earthquake, the shield building possesses sufficient strength, stiffness and ductility to remain functional.

The staff relied on the applicable regulatory requirements such as Appendix S to part 50 for earthquake engineering criteria, and Appendix A to part 50 for general design criteria. The staff also utilized the implementation guidance in NUREG 800 for the standard review plan to conduct its review. The staff reviewed the applicant's design approach of using a combination of ACI code requirements, testing and confirmatory analysis.

In its review, the staff concluded that this approach was found on sound engineering principles and was acceptable, satisfied the applicable NRC regulatory requirements. Based on the applicant's acceptable design approach and the demonstration of a substantial margin in the design on the design basis, loads and beyond the staff concluded that the AP1000 shield building design is safe and provides a reasonable

assurance that the building will remain functional under design basis loads.

In addition, independent reviews by expert consultants to the Office of Nuclear Regulatory Research and the ACRS agreed with the staff's conclusion that the design is safe. Now I will turn the presentation to Denise for discussion on the AP1000 containment vacuum relief system and the waterproofing departure.

DENISE MCGOVERN: Slide 37, please. Certain design basis events and credible inadvertent system actuations have the potential to result in containment external pressure loads. Evaluations of these events show that a loss of all AC power sources during cold ambient conditions has the potential for creating the worst-case external pressure load on the containment vessel.

A containment vacuum relief system was added to an existing vent line penetration. The vacuum relief system consists of redundant vacuum relief devices sized to prevent differential pressure between containment and the shield building from exceeding the design value. This figure depicts the system design. Each of the two vacuum relief device flow paths consists of a check valve inside containment, a motor-operated butterfly valve outside containment and associated piping. Each of these four valves also has a containment isolation function. Each relief device is designed to provide 100 percent of the required capacity. Each relief flow path functions such that a single failure of any of the relief devices would not limit the flow below what is required to mitigate a containment vacuum relief event.

Next slide, please. The containment external design pressure was reduced from 2.9 to 1.7 psid, the opening set point of the vacuum relief system MOVs. While the vacuum relief system MOVs are open, the containment will be at vacuum and flow will be into containment. Once the vacuum condition inside containment is reduced to near ambient pressure conditions, the open signal would automatically clear. This would allow the vacuum relief system MOVs to close automatically in the event that a containment isolation signal or high radiation signal is present.

Next slide, please. In this slide, I will be discussing a COL departure associated with a waterproof membrane. AP1000 DCD revision 15 did not specify the type of material to be used for the waterproofing membrane system for the nuclear island foundation. Therefore, the Vogtle applicant in its ESP SSAR specified an alternate material and elastomeric membrane material utilizing methyl methacrylate resins as the base material. This material was reviewed and approved by the staff as part of the ESP. The AP1000 DCD revision 18 stated that for applicants who choose to use the sprayed on waterproofing membrane system for the foundation, the waterproofing material will consist of 100 percent solid material polymer modified asphalt, or polyurea. The applicant proposed a tier 2 departure from the AP1000 DCD for this issue.

Next slide, please. Vogtle's chosen membrane material will serve as an architectural aid to limit the infiltration of subsurface water for seismic category 1 structures below grade, consistent with

that provided by the DCD. It will also provide for adequate transfer of horizontal seismic shear forces. As I mentioned before, the use of this material was reviewed and approved by the staff as part of the ESP. Therefore, the staff found the departure acceptable. This concludes the Panel 1 presentation. Chapter 3 will be further discussed in Panel 2.

CHAIRMAN JACZKO: Well thank you for that presentation. Maybe to start where you left off. Why the difference in materials for the membranes? Why is it something like that that shows up?

DENISE MCGOVERN: I'll give the simple answer while the expert comes to the microphone.

MOHAMED SHAMS: That was just a choice made by Vogtle early on when they studied the waterproofing membrane. When Westinghouse in rev 15 defined the waterproofing membrane, it was a material that would be mixed with the concrete and Vogtle decided that that was not their choice.

CHAIRMAN JACZKO: What's the substantive difference between the spray-on membrane that was in the DCD versus the spray-on membrane that the applicant actually went with in ESP? Guess the difference between the methyl methacrylate resin and polymer-modified asphalt or polyurea.

MOHAMED SHAMS: Just chemical properties -- some physical properties -- nothing substantive other than that, but the fact that it's a different material, it requires a departure.

CHAIRMAN JACZKO: Now, as I understand, the DCD, or the design certification process, tier two elements are elements that

applicants can modify and change without prior approval from the NRC. Why, in this case, was this specifically requested as a departure?

MOHAMED SHAMS: The reason the staff looked or -- I'm sorry, did you say requested the departure or the staff reviewed --

CHAIRMAN JACZKO: I guess -- the staff reviewed the departure then -- but maybe answer that question. It might be the better question.

MOHAMED SHAMS: Sure.

RAVINDRA JOSHI: The Appendix D, section 8 actually, provides the provisions for the applicant how to deal with departures and there's some process that goes through. Applicant can implement those departures if he can use those certain process analysis that no prior approval required. In this particular case, or not only that, but the rest of the departures that was submitted by applicant, actually reviewed and they in the application actually say that no prior approval required. However, because this entire departure was a part of the application, staff chose to actually review and make sure that we did our part of review and that is reflected in SER.

CHAIRMAN JACZKO: So, they could have chosen not to indicate this departure in the application. Or they could have done it subsequent to COL approval if it was a tier two departure.

MOHAMED SHAMS: They could have done that, yeah.

CHAIRMAN JACZKO: So they just chose to do it, so that's why we looked at it?

MOHAMED SHAMS: Yeah.

CHAIRMAN JACZKO: I mean, we could have [unintelligible] otherwise they would file 50, 59 process and then we could have subsequently reviewed it -- okay. I just wanted to make sure I understood that.

Chapter 1 involves a description of operating experience or information [unintelligible], is that correct?

RAVINDRA JOSHI: That's correct. They actually provided in section 1.4 of the FSAR, they talk about their 3 plants which they have a license for as well as over 30 years of operating experience, plus they also mention about their involvement in the oversight of the NSSS vendors as well as the other A and E as well as the other constructor also, so they explain that particular portion of it.

CHAIRMAN JACZKO: Were there any areas of operational experience that the staff identified that the applicant had not discussed or indicated in the application?

RAVINDRA JOSHI: Our review did not find anything different.

CHAIRMAN JACZKO: Okay. As you, again -- in chapter 1 also includes a description of -- or maybe it's chapter -- yeah, chapter 1 as well. And that includes as part of the operational experience, an explanation or maybe a response or description of generic communications and the applicant's approach to dealing with generic communications. Were there any generic communications that the staff has issued that weren't discussed by the applicant in the application?

RAVINDRA JOSHI: The Applicant's FSAR section 1.8 actually provides the list of all the generic communications that were required

by the applicant to address. So staff looked at all those particular instances like generic letters, bulletins, all those ones, and we confirmed that they have actually looked at everything that they're supposed to be looking at.

CHAIRMAN JACZKO: And those were all the generic communications as of the time of the application. Did they supplement that, that is, the applications being reviewed, this new generic communications are issued?

RAVINDRA JOSHI: They actually added couple of more during the process of submitting. That is correct.

CHAIRMAN JACZKO: And what's the cutoff date then for getting those generic communications? I mean if we issue generic communication tomorrow, does that then require supplement by the applicant?

RAVINDRA JOSHI: Generally speaking, by the regulation, actually they are required to provide that information six months prior to the application date. However, depending upon issue and significance of the issue, we are actually having in a case for the applicant to provide information on those subject matters, so --

CHAIRMAN JACZKO: Okay, can you give me an example of one or two of those that --

RAVINDRA JOSHI: Good example, I can give you in the chapter 8 of the FSAR, there was a generic letter that relates to the underground cable or inaccessible cable that requires some condition monitoring program, that issue actually came during our review of the chapter 8.

CHAIRMAN JACZKO: Is the staff going to talk about that in chapter 8.

RAVINDRA JOSHI: We will be talking about that, yes.

CHAIRMAN JACZKO: The -- and I think you're going to touch on this in the afternoon, so if you are, then you can tell me and I'll ask it later, but the ground motion response specter did exceed the design certification spec. I think the design certifications for rock site I guess or whatever the basis is. Can you tell me a little bit about that analysis or are you going to talk about that in the next --

MOHAMED SHAMS: Sure. We'll talk further about this analysis in the afternoon but I can just mention in general that as COL applicants would have to demonstrate that, if they are to reference the design and not do any changes, that their demands, seismic demands be it, are enveloped by what the DCD was designed for. And for Vogtle, there were exceedances given the specific GMRS or ground motion response spectra-4 for the site itself. There were specific exceedances and they were dealt with. We'll go through how that was done.

CHAIRMAN JACZKO: And you know, and again one of the challenges we have, this is the -- these we are using the updated probabilistic seismic response program. So -- and in comparison, then also to the existing units there would be differences as well presuming, there are -- seismic analysis is a completely type of seismic analysis I guess relative to the existing units.

MOHAMED SHAMS: I would speak to the new units saying that yes, the new seismic hazards were addressed for the existing units,

Generic Issue 199 is dealing with that and each applicant is implementing their way of how to address that.

CHAIRMAN JACZKO: And just a final question on this would be, effectively they resolve GSI 199 through the use of the updated response factor, is that correct? Or is there subsequent analysis that needs to be done for GI 199?

MOHAMED SHAMS: I'd refer that answer to someone else.

WHEREUPON,

SARAH TABATABAI

was called as a witness for the staff of the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

SARAH TABATABAI: I'm Sarah Tabatabai, seismologist in the Office of New Reactors. The applicant did perform an updated seismic hazard analysis. However, there's a new model coming out. They didn't use that, however we don't expect there to be any big surprises. The Charleston Seismic Source Zone dominates the hazard at the site, and there's no fundamental differences between the one we used in this PSHA versus the new PSHA. So there shouldn't be any --

CHAIRMAN JACZKO: And the new PSH then is related, is what 199 is based on? Or this is an additional one beyond that? Or --

SARAH TABATABAI: In GI 199 there it's related to this new PSHA coming out.

CHAIRMAN JACZKO: Okay.

SARAH TABATABAI: Yes.

CHAIRMAN JACZKO: But conceptually they're more consistent, the public seismic analysis that was used in Vogtle is more consistent with 199 than the Vogtle PSHA is relative to the seismic design for the existing unit?

SARAH TABATABAI: Yes they weren't actually, PSHA wasn't actually used for the existing units.

CHAIRMAN JACZKO: Thank you. Commissioner Svinicki.

COMMISSIONER SVINICKI: As a sub-element of the review of financial qualifications, the staff reviews the financial assurance for decommissioning and issues related to that. I had a follow-up question to the staff response to a pre-hearing question on this topic, and my question is as follows: Once the staff receives, as I understand it, a report that would contain the certification for financial assurance for decommissioning wherein the applicant would select the financial instrument to be used for financial assurance for decommissioning -- the selection of that financial instrument -- with what criteria is that reviewed against? And then once it's reviewed and accepted, what kind of communication would the staff issue back to the applicant regarding the acceptability?

WHEREUPON,

MICHAEL DUSANIWSKYJ

was called as a witness for the staff of the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

MICHAEL DUSANIWSKYJ: Good afternoon, my name is Michael

Dusaniwskyj. I'm an economist in NRR. I was the principal reviewer for this area of the FSAR and yes I have been sworn in. The decommissioning funding assurance mechanism is under 10 CFR 50.75 and prior to the licensee -- in this point the applicant, loading fuel they would have to already establish what their decommissioning trust will be and of course prepare the proper trust for it. 10 CFR 50.75 basically gives a possibility of either a sinking fund, pre-payment, parent company guarantee, and a few other methodologies that are prescribed in the regulations. The licensee, or excuse me, the applicant at that point would have to just simply state which one of those they would choose and of course produced for proper certification towards it.

COMMISSIONER SVINICKI: And you said that's prior to fuel loading --

MICHAEL DUSANIWSKYJ: Yes.

COMMISSIONER SVINICKI: -- is when they would make that selection? And how much in advance of that would, is there just some reasonable time frame in advance of fuel loading that you would expect?

MICHAEL DUSANIWSKYJ: I know that the regulations specify 30 days prior or after the Federal Register Notice. Roughly 30 days before they put in to load.

COMMISSIONER SVINICKI: Okay. Could the staff look that up if it's not as you just indicated and provide that in some subsequent testimony? Thank you.

And in relation to a limited work authorizations, could one of the staff witnesses just at a very high level describe the inspection

process that would be used to verify the quality of work performed under an LWA but before further construction takes place? And I'll kind of narrow my question, for example there's a Table 3.8.5-1, which identifies ITAAC and acceptance criteria for the waterproof membrane between the mud mat layers. Can someone describe just generally in terms of inspection of that when and how the designated verification and testing would be completed?

MOHAMED SHAMS: You want me to take a shot at it?

RAVINDRA JOSHI: Yes, take a shot.

MOHAMED SHAMS: In terms of the ITAAC, the design commitment is for Vogtle to demonstrate that their mud mats waterproofing a membrane. It processes the .7 coefficient of friction and as far as the acceptance criteria is for Vogtle to produce a report that documenting this process, documenting that the material and the mud mat system was qualified to provide that. So our inspection process is to -- and I'm not an inspector and I did not do an inspection, but from my understanding is our inspectors visited the site, observed what Vogtle had installed, and ultimately looked at the report to see what was documented in the report to justify that the system actually achieved the requirement. So that was the process for verifying this ITAAC.

COMMISSIONER SVINICKI: Okay, so since it's in the ITAAC process it would generally be pursued consistent with our process for verifying ITAAC. Okay, thank you. I think those are my questions and if I could reserve that time. Thank you.

CHAIRMAN JACZKO: Commissioner Apostolakis. Commissioner

Magwood.

COMMISSIONER MAGWOOD: Thank you, Chairman. General question -- as you were going through the -- I was looking at your slide 11 about the technical qualifications review and states that staff concludes that the Southern Nuclear is technically qualified to hold licenses for Vogtle Units 3 and 4, et cetera. I fully expect the Southern Company is qualified to operate a nuclear plants, and since they do operate nuclear plants, but what goes into that analysis? I mean, is it -- is that an analysis that actually looks at the operating history of the licensee and its performance in operating current plants? What goes into that assessment?

RAVINDRA JOSHI: We did not go into more detail on that one. We actually looked at the information included in FSAR on that basically talks about the -- what kind of oversight they have, what kind of experience they have, and there's a well-known fact that they have been operating these reactors for so many years, so it's -- without going into more detail, we already know about those based on the information. It already exists publicly.

COMMISSIONER MAGWOOD: Let me ask the question a different way, if --

RAVINDRA JOSHI: Okay.

COMMISSIONER MAGWOOD: If we had a case of an applicant that operated a nuclear plant and let's just sort of say hypothetically they had a troubled history, let's say. Would that be a factor in your evaluation?

RAVINDRA JOSHI: I don't know the answer. I'll have to get back to you on that.

COMMISSIONER MAGWOOD: Okay. A couple of these -- these are actually small questions but they are things I couldn't figure out so they were bothering me, so maybe you can help me out. We talked about the MC&A exemptions based on the fact this is a Part 52 application, what exactly are we exempting the applicant from doing?

RAVINDRA JOSHI: There is exception allowed for Part 50 license to have certain requirements that are not to be implemented by power reactor versus fuel facilities, and that exception is not available for Part 52 licensee right now. So we are trying to provide the same treatment that we are giving to the Part 50. So that what I call is really administrative kind of exemption we are trying to give to them because right now the current regulation does not recognize Part 52 applicants or licensees right now.

COMMISSIONER MAGWOOD: So these are program activities that have nothing to do with operating nuclear power plants? Is that what you're saying?

RAVINDRA JOSHI: That is correct.

COMMISSIONER MAGWOOD: Okay. All right. And then this one's even more minor but we haven't been able to figure this one out. The -- both the applicant and the staff made the point of discussing the Part 40 licenses, and the fact that prior to the 103(g) finding there's a condition that basically indicates that the applicant can't – I think the phraseology is, let's see -- receive, possess, or use Part 40

materials in effect. And then after the 103(g) finding, you made a very specific point of saying that the applicant could not possess uranium hexafluoride. You didn't however say they couldn't possess uranium, and I'm just curious as to what is the history of that, and why is that distinction in there?

RAVINDRA JOSHI: I'd like to get my technical staff, Barry Wray, to explain this, especially concerning in terms UF_6.

CHAIRMAN JACZKO: If you can state your name and if you're sworn in or not.

WHEREUPON,

BARRY WRAY

was called as a witness for the staff of the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

BARRY WRAY: Good morning. My name -- my name is Barry Wray, Fuel Cycle Transportation Security Branch of NSIR. I've been sworn in. When we first looked at the application we noticed that there was a provision that allowed them to have UF_6. We couldn't figure out why a reactor would need UF_6, that's something used in the enrichment cycle. And when a facility has UF_6 that activates an ICMO requirement to do a critical target area analysis, so we wanted to put that provision in there -- it's like we don't know why you need it so if you don't need it we want to exclude it so that after you become operational you don't bring it back on for whatever reason. And if you did you would have to go through the ICMO process to do a critical target area analysis. If

you determine you have a critical target area then you have to implement additional security measures to protect that area. But since we couldn't determine why they needed it we thought it best just to eliminate it.

COMMISSIONER MAGWOOD: So that was a response to a specific point in the applicant --

BARRY WRAY: Correct.

COMMISSIONER MAGWOOD: -- Well since the applicant is here can you just give us a little background on that? Why was that in there?

WESLEY SPARKMAN: As a part of the Part 40 License. That's one of the items that's available to us in Part 40, and it wasn't something that we actually needed and it wasn't something that was really considered as a requirement initially, but it was included as part of the license. And so when questioned by the staff we concurred that we would not ever need that and so we were fine with taking that out of the license.

COMMISSIONER MAGWOOD: Interesting. All right, thank you very much. Thank you Chairman.

CHAIRMAN JACZKO: And can you just for the record state what an ICMO is?

BARRY WRAY: It's an Interim Compensatory Measure Order.

CHAIRMAN JACZKO: Commissioner Ostendorff?

COMMISSIONER OSTENDORFF: Thank you Mr. Chairman. I wanted to turn to the site characteristics. I'm going to start out with some

questions. The first question I ask for the applicant and I believe Ms. Aughtman this is in your -- on your slide five. If I understood correctly this is a site characteristics in the ESP and there were three of those that were not necessarily resolved by the ESP process. One of those dealt with the water level and not in the, I wanted to just ask a question on, in that context about flood protection and you made reference to local intense precipitation. I wanted to get a little more of a, a little deeper into what criteria were used to define the probable maximum flood of the Vogtle site?

AMY AUGHTMAN: The criteria that were used to determine --

COMMISSIONER OSTENDORFF: I'm trying to understand is there a particular scenario that was looked at, you know -- you mentioned this intense precipitation. Are we talking about a storm, rainstorm that causes the river to overflow based on historical analyses going back x number of years? I'm trying to understand what was the scenario that defines the level of flood protection you're providing at the site?

AMY AUGHTMAN: So in this case what that's looking at is the precipitation buildup if you will around the nuclear island structure itself. So if there's no, I mean to the extent you have drainage ditches or areas that water could collect, those do contribute but there's not a, the effects of the river are not accounted for here in particular due to our elevation. So since that's a separately established characteristic for contributions from the river. I don't know if that's --

COMMISSIONER OSTENDORFF: So you're, so the flood protection

for the nuclear facilities there, at Vogtle 3 and 4, would be driven by local precipitation that basically could not be handled perhaps by drainage or sewage systems? Is that -- I'm trying to understand what a scenario that might be bounding that we could understand in as far as the site experience in that area.

AMY AUGHTMAN: So in this case that would, this is the parameter that is considered more limiting if you will.

COMMISSIONER OSTENDORFF: Okay.

AMY AUGHTMAN: Because the -- again the site elevation for the plant is at 220 mean sea level and the evaluated flood elevation due to the local intense precipitation is 219.47 feet.

COMMISSIONER OSTENDORFF: Okay. Did you want --

RAVINDRA JOSHI: Is it okay if I ask my staff to add to that?

COMMISSIONER OSTENDORFF: Certainly.

WHEREUPON,

JILL

was called as a witness for the staff of the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

JILL CAVERLY: I was just going to add on. I'm Jill Caverly. I'm a hydrologist in NRO and I have been sworn in. In the ESP phase of the review we looked at several flooding causal mechanisms which included flooding from the river dam break and so forth. In this portion of the -- within the COL phase the only thing we had to look at,

we hadn't looked at in the earlier review was the local intense precipitation on the site itself.

COMMISSIONER OSTENDORFF: Well that, that's, and I'm looking at just that aspect that was not resolved by the early site permit. Can you talk a little more about what the you know maximum of inches per hour or day? Was there a particular criteria that was quantified that would say the site needs to be able to withstand this deluge over a period of time?

JILL CAVERLY: Yeah, the PMP is a method of determining a depth of rainfall over a given site and it's based on hydro-meteorological parameters and it's a method that was developed by the National Weather Service and it's a method that we use to develop a depth of rain over specific area. And in this case it was our site area. I know that PMP for the hourly rate was about 19 inches but, of course, that's for, you know, a water shed. We look at a point rainfall so we look at that depth of rainfall and then we verify that the drainage ditches can handle the amount of flow and move the water away from the specific structures that we're interested in.

COMMISSIONER OSTENDORFF: Okay, let me -- okay, you're getting to, you're answering the questions good. So boring down a little bit on that, do you take the applicant's analysis or does the staff here at NRC do an independent analysis and verification?

JILL CAVERLY: Well, we do a combination of both. In this case we did our, an independent determination of the depth of rainfall and then we used the applicant's hydraulic model but we used that as our

baseline. We checked and we verified the model and then we looked at the model with different parameters and looked at the sensitivity of that -- of that model and how it would be, how does the results would affect the conclusions.

COMMISSIONER OSTENDORFF: Thank you, this is very helpful, thank you. Thank you Mr. Chairman.

CHAIRMAN JACZKO: One follow-up question. Mohamed, you indicated in regard to the ITAAC for the waterproof membrane that the licensee would produce a report. Is it that the ITAAC requires them to produce a report or that they have a report? And I think there's a -- assuming there's a distinction. I mean one I would assume involves submittal to the NRC, one, and involves a report that they have at the site that the staff would then review. I just want to clarify which that is.

MOHAMED SHAMS: The criteria is to have a report.

CHAIRMAN JACZKO: Okay.

MOHAMED SHAMS: And they don't have to submit it.

CHAIRMAN JACZKO: They don't have to.

MOHAMED SHAMS: Yeah, and the staff chooses to close the ITAAC that, would chose to inspect the report and you know understand its contents.

CHAIRMAN JACZKO: Okay, so that would not be submitted and be on the docket?

MOHAMED SHAMS: No it would not.

CHAIRMAN JACZKO: Okay, okay, thank you, appreciate that.

Any other questions or comments? Okay, well we will now break for lunch and we will reconvene at 2:00. Thank you.

(Whereupon, at 12:35 p.m., the above-entitled matter recessed to reconvene at 2:00 p.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

2:00 p.m.

CHAIRMAN JACZKO: Okay, now we'll start our second safety panel this afternoon. We'll have this discussion and then one other panel and then we will close for the day. We'll begin our afternoon session focused on remaining issues in Chapter 3 of the Final Safety Evaluation Report, Chapter 6, and then other relevant sections to the application. Among the issues to be discussed is key safety information incorporated by reference from the AP1000 design certification and then I'll remind, or ask all the witnesses, please again state your name and title for the record and we'll start with the applicants.

WHEREUPON,

AMY AUGHTMAN

WESLEY SPARKMAN

EDDIE GRANT

DONALD MOORE

were called as witnesses for Southern Nuclear Operating Company and, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:

AMY AUGHTMAN: Amy Aughtman, AP1000 licensing supervisor.

DONALD MOORE: Donald Moore, consulting engineer with Southern Nuclear.

WESLEY SPARKMAN: Wes Sparkman, COL licensing supervisor for Vogtle 3 and 4.

EDDIE GRANT: Eddie Grant, AP1000 Licensing Support Lead from NuStart.

WHEREUPON,

RAVINDRA JOSHI

THOMAS SCARBROUGH

were called as witnesses for the staff of the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:

RAVINDRA JOSHI: Ravindra Joshi, senior project manager, Office of New Reactors.

THOMAS SCARBROUGH: Tom Scarbrough, senior mechanical engineer for [inaudible].

CHAIRMAN JACZKO: Are we getting -- Yeah, we need you to come up to the microphones because I don't think we're getting it in the -

RAVINDRA JOSHI: Once again, Ravi Joshi, senior project manager, Office of New Reactors.

THOMAS SCARBROUGH: Tom Scarbrough, senior mechanical engineer, Component Integrity Branch, Office of New Reactors.

BRET TEGELER: Bret Tegeler, senior engineer, Office of New Reactors.

JOHN MCKIRGAN: John McKirgan, chief of the Ventilation and Containment Branch for NRO

CHAIRMAN JACZKO: Thanks, okay, we'll start with the applicant.

WESLEY SPARKMAN: All right, thank you. As you stated, we will be covering in this safety panel, selected topics from Chapters three and six, next slide please. Don Moore will start out by covering the soil structure and action analyses for Vogtle site, I will then

cover our request for a limited work authorization, included in part six, of the COLA application submittal and provide a brief discussion of information related to squib valves. Next, Eddie Grant will cover engineered safety features systems and finally Amy Aughtman will provide information related to our containment cleanliness program and control room habitability. Next slide please, and I will now turn it over to Don Moore.

DONALD MOORE: Good afternoon, I'm Don Moore, consulting engineer with Southern Nuclear Operating Company. I will present the purpose and results of the Vogtle site specific seismic soil structure interaction analysis. As mentioned earlier, the Vogtle GMRS, that is the site ground motion response spectra, compared to the AP1000 certified seismic design response spectra, the CSDRS, showed exceedances at certain frequency ranges, therefore a site specific analysis was performed. The purpose of these SSI analysis is to demonstrate that the calculated Vogtle site-specific seismic response is enveloped by the standard AP1000 certified seismic response used in the design of structure systems and components.

This is allowed per the AP1000 DCD site tier one requirement for seismic ground motion. There were several site specific SSI analyses performed. A 2D Vogtle site specific seismic evaluation was performed as part of the ESP to demonstrate -- as part of the demonstration of acceptability of the Vogtle site limited work authorization alpha. This included a north-south, plus vertical and east-west, plus vertical, SSI analysis using the AP1000 2D structural

model of the nuclear island, but with the Vogtle GMRS as seismic input and the Vogtle site specific soil profiles.

The results showed no material exceedances. In general the AP1000 2D results were significantly higher than the Vogtle 2D results. This large margin provided one of the bases for the acceptability of the Vogtle site limited work authorization alpha. A 3D Vogtle site specific seismic evaluation was performed for the COLA. The AP1000 design is based on a broadened envelope of a 3D seismic analysis results from a number of generic soil block profiles. Therefore, for the COLA a 3D site specific model was used to provide a direct comparison. This evaluation considered a comparison or a check of the in-structure response spectra at six key locations in the nuclear island that is referenced in the DCD. This site specific analysis included three site specific soil profiles, what we called the lower-bound, upper-bound, and best estimate. So our profiles per involving NUREG, NRC NUREG 0800 standard review plan, this accounted for the range of uncertainty in the soil properties.

The 3D model result provided in the COLA demonstrated that the standard AP1000 plant certified design is fully acceptable for the Vogtle site. The 3D comparisons of the Vogtle site specific in-structure response spectra to the AP1000 design envelope and in-structure response spectra showed no material exceedances and overall the AP1000 standard seismic design is significantly greater than what would be required for the Vogtle site specific seismic demand. Thus it is demonstrated that the Vogtle and site specific demand is enveloped by

the AP1000 standard seismic demand used for design and therefore satisfied the tier one requirement for seismic ground motion. Now I'll turn it over to Wes, who will present the next slide on limited work authorization bravo. Thank you.

WESLEY SPARKMAN: Thank you Don. Southern Nuclear requested certain activities be allowed under a limited work authorization in its application for an early site permit, we've called that LWA alpha or LWA one, depending on the context. We received that on August 26, 2009. As discussed in the overview presentation, the work covered in the original LWA is nearing completion. SNC is requesting a second LWA as part of the combined license application in accordance with the 10 CRF 50.10 delta requests for limited work authorizations. SNC was unable to request this additional scope as part of the ESP LWA because the base mat design had not been finalized at that time.

The LWA request is to support the project schedule by assuring these activities occur independent of the COL issuance schedule and contribute to maintaining a margin in the construction schedule that ensures the operation need dates will be met. This LWA requests authorization to perform the following safety related nuclear island foundation work: installation of reinforcing steel, sumps and drain lines and other embedded items in the nuclear island foundation base mat and placement of concrete for the nuclear island foundation base slab.

As part of preparing the environmental report for the COL application, SNC reviewed the conclusions in the ESP EIS to determine if there was any new and significant information that had the potential to

change the NRC's conclusions presented in the ESP EIS as required by 10 CFR 51.50. The methodology for that review is described in the COL application's environmental report in part three. SNC found no new and significant information regarding the impacts of construction. Because the activities covered in the LWA request were considered in the original analysis of construction impacts and in the new and significant review, SNC has determined that there is no new and significant information regarding the LWA activities. Therefore all environmental impacts were reviewed and resolved as part of the ESP FEIS. The final design of the nuclear island foundation is now complete and contained in revision 19 of the AP1000 design control document, which we incorporate by reference into the COLA. This design will be used for the associated LWA activities. Next slide please.

I will now address one of the special topics requested as part of this panel, squib valves. The design and qualification of the squib valves is addressed by the AP1000 DCD, which is incorporated by reference into our COLA. During the advisory committee on reactor safeguards -- review of the COL application, the ACRS members questioned whether given the importance of squib valves, additional aspects should be added to the in service testing and in service inspection programs to ensure the operability of these valves. SNC has addressed this in the FSAR by ensuring that the industry and regulatory guidance is considered in the development of the IST program for squib valves and that in addition to the test firing of the explosive actuator charges in accordance with the ASME code, the IST program for squib valves will

incorporate lessons learned from the design and qualification process for these valves such that the surveillance activities will provide reasonable assurance of the operational readiness of the squib valves to perform their safety functions. Next slide please. I will now turn the presentation over to Eddie Grant.

EDDIE GRANT: Thank you Wes. Chapter Six describes the engineered safety features and this information is primarily within the scope of the DCD and thus provided in the DCD and incorporated by reference into the COL application FSAR in the corresponding sections of Chapter Six. Some key systems addressed, described, and evaluated in this chapter include the passive core cooling system and the passive containment cooling system. The license is also expected to contain the associated ITAAC for these systems as provided in tier one of the DCD.

The COLA FSAR does provide some supporting information on the systems, some quality controls or special processes and this is provided in section 6.1 of the COL FSAR and also some programmatic information related to leak-rate testing in 6.2 and some programmatic in-service inspection information in Section 6.6. We've also included some information on containment cleanliness and control room habitability in section 6.3 and 6.4, respectively, and I will now turn the panel discussion over to Ms. Aughtman to provide some additional information on these two topics.

AMY AUGHTMAN: Thank you Eddie. So on the subject of containment cleanliness, the DCD addresses the design and analysis aspects of assuring long-term coolant following a loss of cooling

accident. The DCD, however, could not describe the programmatic aspects for a containment cleanliness program and therefore created a COL information item for COL applicants to address. COL information item 6.3-1 was addressed in a standard manner and describes the containment cleanliness program elements that would control containment entry and exit, housekeeping and a sampling program. This sampling program would be used to confirm that we are within the limits, the debris limits, that are specified in the DCD as tier two star requirements. Next slide.

And the final topic related to Chapter Six is on control room habitability. The control room habitability design is incorporated by reference from the DCD. There are DCD ITAAC for both the emergency and non-radioactive ventilation systems. FSAR subsection 2.2.3 evaluates the impacts of potential accidents in accordance with reg guide 1.78 as appropriate. This subsection also incorporates by reference evaluations that were provided and resolved at the ESP phase. FSAR subsection 6.4.3 indicates that procedures and training will be conducted in accordance with Reg guides 1.78 and 1.196.

FSAR section 6.4.4 provides the results of standard and site specific chemical evaluations. The standard evaluations were based on standard plant plans and assumptions that Westinghouse made. The site specific evaluations considered other materials that are specifically planned for the Vogtle site. FSAR table 6.4-201 provides the material name, physical state, evaluated quantity and distance to the control room intake, describes the evaluated location and the type of evaluation

that was performed.

Subsection 6.4.4 also indicates that an analysis was performed to confirm that doses to control room operators from an adjacent AP1000 unit would not be higher than the doses on the affected unit. This analysis was performed in a standard manner. For Vogtle, we also have our existing units on site and the impacts as a result of an accident on those two units were evaluated at the ESP phase and resolved.

To summarize, there are no chemical or radiological hazards that were identified that would challenge control room habitability as a result of these evaluations. This concludes our presentation for safety panel two.

CHAIRMAN JACZKO: Thank you. The staff can give their presentation now?

RAVIDRA JOSHI: Good afternoon, once again my name is Ravi Joshi. The staff will now continue to discuss the remaining COL portion of Chapter Three, then go to Chapter Six. Joining me at the table are Bret Tegeler on my left, Tom Scarbrough on my right, and John McKirgan will be presenting Chapter Six, sitting at the end. I will turn over to Bret to continue the discussion of Chapter Three. Bret?

BRET TEGELER: Thank you Ravi. Good afternoon, my name is Bret Tegeler, I'm a senior structural engineer in the Office of New Reactors, and I was the lead reviewer involved in the review of the Vogtle COLA application. On the next few slides I'll review the seismic design and analysis issues for Vogtle units three and four and I'll

describe the resolution of these issues.

To assess the suitability of the AP1000 standard design for a particular site, the AP1000 DCD requires the COLA applicant to make a comparison of site-specific ground motion response spectra or GMRS, to the certified seismic design response spectra, or the CSDRS, of the standard design. In the case of Vogtle, the GMRS exceeds the CSDRS in the low and high frequency ranges. Consequently, the applicant was required to perform a plant-specific seismic evaluation to demonstrate that the AP100 will meet the General Design Criteria 2, or design basis for the protection against natural phenomena. Vogtle accomplished this by showing that the AP100 structure systems and components will remain functional during and after a safe shutdown seismic event. The applicant developed a detailed, three dimensional soil structure interaction model of the nuclear island, referred to as the NI15 model. Excuse me. This model made use of shell, beam, and solid elements, to model the AP100 structural members. The refined NI15 model was based on the AP1000 seismic analysis model but it used a finer mesh to capture the high frequency range of response where the Vogtle GMRS exceeds the AP1000 CSGRS. For modeling the soil that supports and surrounds the nuclear islands, the applicant performed three, sorry, the applicant developed three deterministic soil columns representing the best estimate, lower bound and upper bound sheer wave velocity profiles.

The SSI model, comprising the soil column profiles and the NI15 structural model was run using acceleration time histories matched to the free field response spectra. The envelope formed by the best

estimate, lower bound and upper bound analysis results were used to compare the in-structure response spectra for Vogtle to the in-structure response spectra of the standard design at six key locations. Next slide please.

The staff performed a review of the applicant's in-structure response spectra at the six key locations. These comparisons showed that above one Hertz there were no exceedances of the standard design. However, below one Hertz there were exceedances in the 0.55 hertz range. The staff found that these exceedances were not significant because there were no AP1000 structure systems or components with resonant frequencies in this range. The staff, after a detailed review of the applicant's modeling approach and input parameters, found that the analysis was performed in accordance with standard review plan guidance.

The staff reviewed the applicant's use of four percent structural damping instead of the five percent used in the standard design analysis model and verified that this damping value was representative of the predicted levels of stress and strain. The applicant's assumption to use lower damping and therefore credit less energy dissipation is acceptable because the seismic demands on Vogtle units three and four nuclear islands are not as severe as those analyzed for the standard design.

The staff confirmed that the validation of the applicant's computer models by making independent comparisons of responses between the NI15 model and the AP1000 analysis model. We were careful to ensure

that the ongoing changes made to the AP1000 seismic model, such as the shield building design changes, had been reflected in the applicant's NI15 model. The NSC staff concluded that a site specific soil interaction analysis performed by the applicant to evaluate the exceedances of the AP1000 CSGRS by the Vogtle GMRS demonstrated that, from a structural perspective, the AP1000 design is adequate for use at Vogtle. Next slide please.

Next I'll discuss the applicant's request for a second limited work authorization or LWA. The applicant proposed to install the Vogtle foundation base slabs, also called base mats, during this authorization. In part six of the COL application the applicant submitted details for performing work within the scope of the LWA request. This is in accordance with 50.10(d). The scope of the request involves the installation of reinforcing steel, sumps, drain lines and other items to be embedded in the nuclear island base slabs. In addition, it calls for the placement of the slabs concrete. In the LWA request the applicant stated that the rebar and other embedded items would be above the mud mats and inside of the mechanically stabilized earth walls. These walls will serve as a permanent form works for the nuclear island foundation base slab. Additionally, the applicant stated that the design of the base slabs reinforcing and concrete are in accordance with the applicable codes and standards as described in the AP1000 DCD.

The staff used section 385 of NUREG0800 in its review of the applicant's LWA request to construct the nuclear island foundation base

slabs. On the basis of its review of the AP1000 DCD and the site specific seismic analysis, the staff finds that the applicant's proposed scope of work to be acceptable. The staff accepted the applicant's proposal based on the DCD commitment to use ACI 349 for the design of the base slab and the finding that the standard plant design is acceptable for Vogtle. Consequently, the staff finds that there is reasonable assurance that the base slabs will have adequate strength, stiffness and ductility under the Vogtle seismic demands. Additionally, as part of the AP1000 standard design review the staff found the detailed design of foundation base slab and method of construction to be consistent with new NUREG0800 Section 3.85 and therefore acceptable.

The staff's review is described in AP1000 SER section 3.8.5. Consequently the staff concludes that the limited work authorization request is consistent with the applicable requirements of part 50.10(d) for the installation of the nuclear island foundation base slabs for Vogtle units three and four, including the placement of concrete.

This concludes my presentation. Tom Scarbrough will continue with the discussion of squib valves.

THOMAS SCARBROUGH: Thank you, good afternoon. Next slide, can you get the slide, slide six, next up, there you go, thank you. The AP1000 reactor design uses explosive actuated valves, referred to commonly as squib valves, in the automatic depressurization system to reduce reactor pressure to allow the gravity driven system to provide cooling water to the reactor core in the event of a loss of cooling accident. The AP1000 reactor design also uses squib valves in the

passive core cooling system to allow the injection of cooling water into the reactor vessel, to provide for natural recirculation of the containment sump to the reactor cooling system, and to increase the containment water level if necessary in the event of a severe accident.

The AP1000 design control document requires the use of ASME standard QME-1, that's 2007, which specifies qualification methods for mechanical equipment in nuclear power plants to demonstrate the design basis capability of safety-related valves. The NRC staff accepted the use of QME-1-2007 in revision 3 of the regulatory guide, 1.100. For the qualification of power operated valves to perform their design basis safety functions QME-1-2007 incorporates lessons learned from valve testing and research programs performed by the NRC Office of Nuclear Regulatory Research and the nuclear industry in response to past performance issues with motor operated valves at nuclear power plants. Tier one of the AP1000 DCD specifies ITAAC to require that tests be performed that demonstrate the capability of AP1000 squib valves to operate under their design conditions. The ITAAC also require that a report exists and concludes that the squib valves are bounded by those tests. The NRC staff is monitoring the design and qualification process for the Vogtle squib valves through attendance at design review and test planning meetings at the Westinghouse offices, the valve vendor facility in Erie, Pennsylvania, and the test facility in Huntsville, Alabama. The staff has also observed the performance of prototype tests of the squib valves by the valve vendor. In addition, the staff is monitoring the development of surveillance provisions for the squib valves,

including in-service testing and internal inspections.

The NRC staff conducted audits of the valve procurement specifications as part of the Vogtle COL application review. During the audits the staff found that the procurement specifications for the Vogtle squib valves applied the principles of QME-1-2007 in the qualification process. Prior to the start up of Vogtle units three and four, the NRC staff will conduct inspections in support of the closure process for the ITAAC, requiring the qualification of squib valves to perform their safety functions. The NRC regulations in 10 CFR 50.55a required COL licensees to implement the edition of the ASME code for operation and maintenance of nuclear power plants for in-service testing of pumps and valves in new reactors that is incorporated by reference in the regulations 12 months before fuel loading. COL licensees are required to update their IST programs to the latest ASME OM code edition, incorporated in the regulations every 10 years.

With respect to squib valves, the addition of the ASME OM code presently incorporated by reference in 50.55a focuses on test sampling of the propellant charges in the simple squib valves used in current operating reactors. The NRC staff is participating in an ASME project to revise the OM code to provide updated IST requirements for new reactors, including improved surveillance provisions for testing and internal inspections of squib valves.

The 2011 addenda to the ASME OM code provides several IST improvements for new reactors with additional improvements such as squib valve replacements being considered for later code editions. When the

ASME project is complete the NRC staff will review the OM code improvements for new reactors for incorporation by reference in 50.55a with appropriate modifications including applicable improvements to the IST requirements for squib valves. Next slide please.

Commission paper SECY 05-0197 states that a COL applicant should fully describe the in service testing and other operational programs as part of its application to avoid the need for operational program ITAAC. Using the guidance in the NRC standard review plan section 3.9.6 and regulatory guide 1.206, the NRC staff reviewed the description of the IST operational program submitted with the Vogtle COL application to determine whether a reasonable assurance finding could be reached on the acceptability of the IST program description. In addition to meeting 50.55a the Vogtle FSAR requires that the IST program for squib valves incorporate lessons learned from the design and qualification process for these valves, such that surveillance activities provide reasonable assurance for the operational readiness of squib valves to perform their safety functions. Based on the requirements in 10 CFR 50.55a and the IST program description in the Vogtle FSAR, the NRC staff found that the Vogtle COL application adequately describes the IST program for squib valves for incorporating the lessons learned from the design and qualification process, such that there is reasonable assurance of the operational readiness of squib valves to perform their safety functions. That concludes my presentation. I'll turn it over to John for Chapter Six.

WHEREUPON,

JOHN MCKIRGAN

was called as a witness for the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

JOHN MCKIRGAN: Thank you Tom. My name is John McKirgan, I'm chief of the containment ventilation branch in NRO. To provide a context for the COL incorporation by reference of the AP1000 design I will briefly describe some of the basic AP1000 engineered safety features. As discussed in the next few slides, the AP1000 design uses passive safety features to provide safety functions for emergency core cooling and long-term core cooling, containment heat removal, and control room habitability without operator action or reliance on AC power. In addition there are normal or non safety active systems that provide many of the accident mitigation functions as well. For example, there is a non safety make up system, residual heat removal system, containment spray system and control room ventilation system. The non-safety active systems are not credited in the accident analysis but are expected to function if available, but now we will turn to the passive systems that are credited in the accident analysis. Unlike the current operating fleet, the AP1000 design uses passive systems that rely on natural forces such as gravity to operate. Next slide please.

This figure shows that the AP1000 passive core cooling system design. The passive core cooling system consists of one passive residual heat removal heat exchanger, two core make up tanks, two accumulators, two sets of automatic depressurization valves, and one in-

containment refueling water storage tank. The in-containment refueling water storage tank, or IRWST is a large tank located above the reactor coolant loops containing borated water. It is the source of low-pressure safety injection and the heat sink for the passive RHR, residual heat removal, heat exchanger. The passive RHR heat exchanger is connected to one reactor coolant system hot leg and a steam generator cold leg plenum. The passive RHR heat exchanger is submerged in the IRWST, and removes core decay heat by natural circulation. The passive RHR heat exchanger in conjunction with a passive containment cooling system, is designed to remove decay heat in a closed loop mode of operation. The core makeup tanks are located above the RCS loops and filled with borated water. Each core make up tank inlet is connected to the reactor coolant system, or RCS, by a pressure balance line from a cold leg, to maintain the core make up tank at the RCS pressure. Each core make up tank outlet is connected to a direct vessel injection line. The automatic depressurization system, or ADS, consists of four stages. The first three stages are connected to the top of the pressurizer and discharged into the IRWST. The fourth stage valves connect to the top of the hot legs and discharge into the containment atmosphere. The ADS are actuated sequentially to depressurize the RCS, to allow for gravity injection from the IRWST. The accumulators similar to those used in operating plants are filled with borated water that is pressurized with nitrogen. Each accumulator will inject into the RCS through a direct vessel injection line when the RSC pressure falls below the accumulator pressure. For events other than loss of coolant accidents, the passive

RHR heat exchanger will actuate to remove decay heat. The passive HRH heat exchanger is designed to cool the reactor coolant system. This allows the reactor coolant system to be depressurized, and allows the plant conditions to be established for initiation of normal residual heat removal system operation. For loss of coolant accidents, the core make up tanks will actuate to provide safety injection. When the core make up tank levels decrease, the ADS valves are actuated to depressurize the RCS. Once the RCS has depressurized from either the opening of the ADS valves or from the loss of coolant accident, the accumulators will inject automatically.

The in-containment refueling water storage tank injection lines open automatically on a fourth stage ADS actuation signal. Gravity injection from the IRWST starts when the reactor coolant system has been depressurized to below the IRWST injection head. After the accumulators, core make up tanks and the IRWST inject, the containment is flooded up. When the IRWST level decreases to a low level and the containment is flooded up to a level sufficient to provide recirculation flow, the containment recirculation lines open to allow containment sump water to circulate through the direct vessel injection lines back into the reactor coolant system. This provides long-term recirculation core cooling and is driven entirely by natural circulation. The use of natural circulation here is one of the somewhat novel aspects of the AP1000 design. Next slide, please.

The primary containment serves as an interface to the ultimate heat sink, and is an important component of the passive

containment cooling system. This figure shows the basic design. Steam, either from a IRWST heat up, or from a pipe break, condenses on the interior wall of the containment. Heat is transferred through the steel containment to the exterior of the containment vessel. A path for the natural circulation of air from the outside is always open. Natural circulation air flow path begins at the shield building inlet, goes through the annulus, past the primary containment vessel, and out the exhaust. The containment is cooled by this air flow and by evaporation of water from a gravity fed tank. The containment shell provides a surface for evaporative film cooling, and works in conjunction with the natural draft air flow created by the shield building and exhaust arrangement, to reduce the pressure and temperature of the containment atmosphere, following a design basis accident. The source of water for the evaporative cooling is the passive containment cooling water storage tank, located at the top of the shield building.

Actuation of the passive containment cooling system consists of opening the passive containment cooling water storage tank isolation valves. This allows the water in the tank to be delivered to the top external surface of the steel containment shell. The flow of water, provided entirely by the force of gravity, forms a water film over the dome and side walls of the containment structure. This flow provides cooling and the desired reduction in containment pressure and time, and removes decay heat. Here again is a somewhat novel feature of the AP1000 design and its use of gravity and natural circulation to provide this cooling function.

Now, as a part of the shield building design change, the number and size of the air vent openings was revised. Westinghouse performed a revised safety analysis to confirm adequate containment pressure control. In the AP1000 DCD review, the staff reviewed these changes and performed independent confirmatory analysis, and found the changes acceptable. The ACRC reviewed both the Westinghouse analysis and the staff's independent analysis, and also found them acceptable. Next slide, please.

As part of the DC amendment, Westinghouse provided information to resolve generic safety issue 191. Westinghouse evaluated the effects of containment debris generation on the ability of the emergency core cooling systems to function. The AP1000 has containment recirculation screens and IRWST screens to capture debris following a LOCA. All screen are designed to have solid top covers, so that the debris that settles out of the water does not fall on the screening surfaces. The screens are constructed of stainless steel to be corrosion resistant, and are comprised of individual pockets to provide greater filtering area for a given volume.

In addressing GSI 191, Westinghouse relies on AP1000 design attributes and a stringent containment cleanliness program, which results in a very low debris source term. The principal design features include using low or non-fibrous insulation, like metal reflective insulation, limiting the amount of aluminum that can be submerged, and selecting coatings that limit debris generation and transport. The screens are designed to provide a negligible reduction in flow due to

debris accumulation. Head loss testing, using the design basis source term, and prototype screens, verifies negligible head loss across the screens. The key design features are specified in the AP1000 DCD and verified through ITAAC. A COL applicant is also required by a COL action item to implement a stringent containment cleanliness program that limits the amount of latent debris on the containment. I will discuss the containment cleanliness program more in a later slide.

To resolve the in-vessel issues related to GSI 191, Westinghouse performed a series of fuel assembly head loss experiments to quantify the effects of fibrous and particulate debris, and containment chemical effects on the head loss across the fuel assemblies. Westinghouse used a partial height fuel assembly to model, pardon me, a partial height fuel assembly model that is consistent with the fuel assembly design described in the AP1000 DCD. The flow rates, debris loadings, and methods of debris addition vary from test to test. The ratio of fibrous to particulate debris varied, as did the temperature and chemistry of the cooling. The purpose of the test was to select a combination of debris variables and simulated plant variables that would bound any AP1000 LOCA, and to demonstrate adequate long-term cooling for the AP1000 design. The fuel assembly test results showed the head loss was well below what would prevent adequate core flow, and therefore demonstrated that adequate core cooling is maintained under a post-LOCA environment. The staff's review is documented in the FSER. The ACRS review, as documented in their December 20, 2010 letter concluded that the regulatory requirements for

long-term cooling for design basis accidents have been adequately met, and for the AP1000 design, and GSI 191 is resolved.

In response to ACRS about potential future changes to the latent debris limit and the containment cleanliness program, the DCD revision 19 designates information related to the debris source term as Tier 2 star material. The final rule will also include this item.

Turning to containment peak pressure, during the review by the ACRS, the committee found a scaling error in the containment pre-pressure analysis related to the time for the containment to be fully wetted. This error was part of the initial certification. As part of the corrective action for this discovery, Westinghouse reassessed the mass and energy release, and containment peak pressure analysis calculations. In this assessment, they found other areas where the analysis had not been updated to reflect design changes. For example, the use of an epoxy top coat had not been modeled. Westinghouse also found other items that were viewed as nonconservative assumptions, like omitting the contribution of nitrogen from the accumulators to the peak pressure calculations. After the accumulators inject water into the RCS, the nitrogen can increase containment pressure by a small amount.

DCD revision 19 addresses all of these changes to the analysis, which had the overall effect of increasing calculated peak containment pressure. However, the updated analysis also revises other assumptions that resulted in off-setting the effects of some of these increases. For example, Westinghouse took credit for some existing metal gratings inside containment to act as heat sinks, which reduce the

calculated peak containment pressure. The specific gratings used in the analysis were designated as Tier 2 star material. As a result, the calculated peak accident pressure was changed from 57.8 PSIG to 58.3 PSIG. The calculated peak accident pressure is referred to as P_a and is included in the technical specifications as the pressure to be used for containment leak rate testing. This remains below the containment design pressure of 59 PSIG. The staff notes the calculated peak accident pressure is calculated in a conservative manner. Additionally, the staff expects the containment vessel to remain functional at pressures well above the design pressure. In the AP1000 safety evaluation, the staff reviewed these changes and performed confirmatory calculations, and found the changes acceptable. Next slide, please.

The AP1000 design includes an active non-safety related ventilation system, with two 100 percent capacity supply air handling units, return fans and filtration. The system is not safety related and requires AC power to function. The main control room emergency habitability system is a passive system. The design consists of safety related canisters of air that supply the control room with fresh, uncontaminated breathing air. The system also includes an eductor driven filter train to clean the control room air. This system does not require AC power to function. To promote the use of AP1000 design at more sites, the radiation dispersion factors or χ/Q were expanded in the AP1000 DCD amendment. In developing a control room integrity program, which includes in-leakage testing for the control room envelope, Westinghouse was able to establish an achievable acceptance criteria for

the in-leakage testing with the new radiation dispersion factors. As a result, Westinghouse made a series of significant design changes to add margin to the control room dose calculations. The changes included reducing control room in-leakage, through various design provisions, such as precluding duct work from penetrating the control room envelope, and reconfiguring the vestibule.

A filter train was added to the passive system, as well. The filter train consists of an eductor, with duct work, silencers, a particulate filter and a high efficiency particulate or HEPA filter. The revised configuration was reviewed by the staff and found to be acceptable. The ACRS also reviewed the Westinghouse submittals and the staff safety evaluation and found them acceptable.

That completes our discussion of information incorporated by reference, from the AP1000 DCD. We will now move on to the staff review of two topics in chapter six, of the Vogtle FSAR. They were not incorporated by reference, but instead items that the COL applicant needed to address. Next slide, please.

The two topics we will discuss are the containment cleanliness program, and threats to the control room from toxic gas. The applicant's containment cleanliness program is described in chapter 6.3 of the Vogtle FSAR, which provides details of the program and procedures to minimize the amount of debris that might be left in containment following refueling and maintenance outages. The program includes requirements for cleanliness inspections and limits on materials introduced into containment. The staff's evaluation of the

program is described in the Vogtle FSER, section 6.3. The staff found the Vogtle containment cleanliness program acceptable, because it is consistent with regulatory guide 1.82, and related guidance document recommendations that will limit the latent debris to acceptably small quantities used in the long-term cooling evaluation. The long-term cooling analysis demonstrates the plant complies with the emergency core cooling requirements set forth in 10 CFR 50.46.

The ACRS recommended in its letter, that the technical specifications include containment interior cleanliness limits on latent debris. ACRS also indicated that the basis for this recommendation was that the latent fiber acceptance limits should not be changed without NRC staff review. The staff agrees with ACRS, that the AP1000 fiber limits are particularly stringent and the limits should not be changed without NRC review. However, it is more appropriate to address this issue by designating the information as Tier 2 star in the AP1000 design control document, rather than including them in the Tech specs of the COL. The AP1000 DCD was revised to reflect that.

Now, I will discuss the toxic gas review. In the evaluation presented in section 2.2.3 of the SER, the staff reviewed the applicant's chemical inventory and screened out the toxic chemicals that do not pose a threat to main control room habitability. The staff determined that hydrazine, carbon dioxide, methoxypropylamine, or MPA, and ammonium bisulfate had the potential to exceed established limits outside the main control room. The applicant conducted analysis which the staff reviewed. Further, the staff performed independent

confirmatory calculations. The final analysis for the staff and the applicant shows that the concentrations of these chemicals at the controlled intake, and inside the control room, would not exceed the established limits because the design of the control room ventilation intake at the auxiliary building is located some 57 feet above ground. The staff concluded that the applicant complies with GDC 19, and the control room will remain habitable. That concludes the staff's presentation for this panel, and we are prepared to take your questions.

CHAIRMAN JACZKO: Well, thank you. We'll start maybe with just -- the last point, the containment debris limitation. Explain to me how Tier 2 -- as I understood it ACRS was concerned, they were worried about the operational limit on the three kilograms of fiber or -- and that the 50 kilograms of debris. How will a Tier 2 star element in the DCD be captured and maintained in operations, in plant operations in the same way that a Tech Spec would?

JOHN MCKIRGAN: One of the key issues for the ACRS in the discussion was that the -- they were concerned that the applicant would be able to change these limits, and operate for some period of time without the staff being aware. And so they were very concerned that the staff would review and approve those and not -- they had some concern that over the 5059-like process that's established in Appendix D. And so the intent really was to get the staff review on these. The staff considered, and there was discussion during the meeting, about the use of Tech Specs, and whether that was the most appropriate regulatory tool. And in the end, the applicant proposed Tier 2 star. The staff

reviewed that and agreed it seemed to keep the intent of the ACRS desire to have that review --

CHAIRMAN JACZKO: Right, we don't have a lot of time here but, I'm trying -- and again, I'm not terribly expert at this stuff, but a Tech Spec is something that an operator licensee has to monitor, and if their plant conditions deviate from a Tech Spec then there are certain they have to take within certain periods of time. They have to remember and modify the condition. That's very different, in my mind, which appears to be the intent of the ARCS, that you're monitoring this on a fairly rigorous basis. That's very different from a licensing requirement in a Tier 2 star, that from a licensing perspective they cannot deviate from the limits, the three kilograms, and the 59 kilograms. So, from an operational standpoint, how does that Tier 2 star achieve the same effect as a Tech Spec that has to be more currently monitored?

JOHN MCKIRGAN: The limits established -- are established in Tier 2 star. The cleanliness program and the description, which is fairly detailed in the Vogtle FSAR of that program, including the reference to the NEI guidance on how to do sweeps and do sampling to ensure that you stay below those limits, so when the staff looks at the totality of that regulatory process, that's viewed as --

CHAIRMAN JACZKO: What happens when a licensee is doing their sweep and they then determine -- I don't know if they determine before they raise power or when they make that determination -- but what if they make a determination that exceeded the three kilogram? What do

they do -- or the 59 kilogram -- what do they have to do given that it's a Tier 2 star?

JOHN MCKIRGAN: Well, in Tier 2 star, I mean, the sweeps are done on the exits, they're evaluated -- I'd have to think for a moment --

CHAIRMAN JACZKO: I mean, if there's a Tech Spec, there would be an action associated when --

JOHN MCKIRGAN: Yes.

CHAIRMAN JACZKO: So, what is that comparable action with a Tier 2 star?

JOHN MCKIRGAN: Yeah, I mean, the other actions the staff we're considering is that these kind of actions --

CHAIRMAN JACZKO: No, no, sorry I'm asking what's the comparable way that a Tier 2 star commitment is the same as a Tech Spec when, you know, 15 years into operation and they're doing the sweeps, and they exceed the limits, what happens under Tier 2 star?

JOHN MCKIRGAN: We'll have to get back to you on that.

CHAIRMAN JACZKO: Okay, thanks, I appreciate -- I probably could have waited to do that. But I think that, as I understand what the ACRS is saying, that was the relevant issue, is that it's during operation and it's just one of those specifics -- if you can just kind of help me understand that better, I'd appreciate it. Okay, turning back to the squib valves, which seems to be fairly risk significant component, the key here seems to be a couple of things. And again, my impression may be wrong of that whole squib valve thing, I'm trying to

piece together a lot of information in a very period of time. So, as you look at squib valves, the whole point that I'm seeing is that we don't quite have everything done yet, maybe. And we're waiting on an updated ASME code, we're waiting on kind of lessons learned from the testing program, I guess, to figure out kind of lessons learned, and how we can kind of monitor the squib valves in an effective way. Is that a fair assessment or no?

THOMAS SCARBROUGH: Yes, sir. Because it's an operational program --

CHAIRMAN JACZKO: Yeah.

THOMAS SCARBROUGH: The way the process was set up was the applicant would submit a description of the program, and Vogtle submitted as part of their FSAR, a description of their IST program. One is they specified that they will meet the ASME OM code, and then specifically --

CHAIRMAN JACZKO: The code doesn't exist yet, right?

THOMAS SCARBROUGH: Well, there is, the code does exist and it does have --

CHAIRMAN JACZKO: But is the code, as it stands right now, sufficient from say ACRS's perspective, to accomplish what they believe is necessary for in service inspection for squib valves?

THOMAS SCARBROUGH: For squib valves, for the new reactors, no. And we agree with ACRS, that the --

CHAIRMAN JACZKO: So there is no ASME code right now?

THOMAS SCARBROUGH: It has provisions, but they focus on

sampling of the propellant charges --

CHAIRMAN JACZKO: But they're not sufficient?

THOMAS SCARBROUGH: Right, we don't think they're sufficient, and the ACRS does not either.

CHAIRMAN JACZKO: Okay, so how are we saying that the description of the program is sufficient then, if we know it's contingent on ASME code inspection that doesn't exist right now?

THOMAS SCARBROUGH: That's why we had them specify in the FSAR that the surveillance requirements that they developed as part of the program must incorporate the lessons learned from the design and qualification process, that's ongoing.

CHAIRMAN JACZKO: But if it's in the -- and again, I'm learning, I think -- if it's in the FSAR, then it's a 50.59 change process.

THOMAS SCARBROUGH: Right, well, except, for an operational program, we'll conduct operational program inspections and 12 months before a fuel load, the then licensee will have to apply the OM code that's incorporated by reference.

CHAIRMAN JACZKO: But what if ASME's not done with that code at that point?

THOMAS SCARBROUGH: Well currently ASME has issued the 2011 addenda, which has some improvements for new reactors.

CHAIRMAN JACZKO: And is that sufficient in our mind for what's --

THOMAS SCARBROUGH: Not yet. They're starting to --

CHAIRMAN JACZKO: SO what happens if in 12 months, before start-up, there's not an ASME code that we're comfortable with? What do we do at that point?

THOMAS SCARBROUGH: Well, two things. One is we currently are reviewing the 2011 addenda, for incorporation by reference and we are --

CHAIRMAN JACZKO: Well, I, we have very little time here, so I'll end it with this but -- what do we do, I mean -- it's all contingent on a new ASME code which doesn't exist, and an FSAR, which is not a very strong commitment. So, what do we do if we get to this point and this is no ASME code at that point?

THOMAS SCARBROUGH: The operational program inspection for IST will be done before fuel load. And then --

CHAIRMAN JACZKO: So we would, so essentially what, I'm going to have to cut you off here, so we would essentially find, we would have an inspection finding against the program.

THOMAS SCARBROUGH: It's inadequate. And then we report back to the commission for the 103 finding that we found their IST program inadequate.

CHAIRMAN JACZKO: But there's not ITAAC related to the operation?

THOMAS SCARBROUGH: No there's no ITAAC --

CHAIRMAN JACZKO: So that wouldn't be a 103(g) finding?

THOMAS SCARBROUGH: Well, it would be as far as the overall approval of the, you know, operation of the plant. So, it would be that

permission to start the plant up --

CHAIRMAN JACZKO: Okay, so it would not contingent on the 103(g) finding, but you could potentially be in a position that would effectively put the plant into column five in the action matrix, during start-up?

THOMAS SCARBROUGH: Well, we would recommend not starting the plant up, at that point, if they did not have an adequate surveillance for the squib valve.

CHAIRMAN JACZKO: I'm going to have to stop you right there, I apologize, but you know, we can do a follow-up question to get, I mean, OGC can kind of weigh in about how, what our, again, where we get into this funny legal space where we don't have an ITAAC for something, an operational program that we're finding insufficient that could, in the staff's mind, not allow start up of the plant and what's our legal authority to do that at that point if we don't have an ITAAC, so, maybe I'll have you do that in writing and then --

THOMAS SCARBROUGH: Okay, that's fine. Thanks.

CHAIRMAN JACZKO: Okay, Commissioner Svinicki.

COMMISSIONER SVINICKI: Okay, thank you. My questions are principally for the staff. If I have anything for the applicant, I'll designate that. But, on the staff's slides three and four, you talk about review of seismic issues, and specifically the applicant had a 3D soil structure interaction analysis. Could a staff witness just generally address how, when you have that kind of a 3D model of something, what is your process for independent validation that a model

developed by the applicant such as this 3D soil structure interaction analysis is an accurate representation so that it can be relied upon. What, in general, do you look at in validating the usage of something like that?

BRET TEGELER: I can address that. The process we used to look at the Vogtle model was to make direct comparisons to the AP1000 three-dimensional model that was used in the standard design. So, as an example, we would take -- we requested Southern to take their NI15 model and imply the same base motion input into that model as what was done with the AP1000 model, and compare responses at six key locations. In the case of the NI15 model, the responses came out very close, so we judged that model to be adequate, to represent the AP1000 design.

COMMISSIONER SVINICKI: So it's fundamentally a comparison and cross-referencing type of operation?

BRET TEGELER: Correct. Other metrics are looked at: total model mass, frequency response, element properties with respect to material properties and element types. So, we do a pretty thorough check of that model.

COMMISSIONER SVINICKI: Okay, thank you. And on staff slide 11, this is a question a little bit in a similar vein. The applicant utilized data from fuel assembly head loss tests that you were discussing there. And I believe a statement was made that it was a partial assembly that was utilized, obviously a full assembly would be very large. In that instance, where you have the applicant providing some test results but they have had to design the test and

experimentation, how does the office of new reactors, or do you in consultation with the office of research, how do you assess that the experimental set up is accurate and can be relied upon for licensing purposes?

JOHN MCKIRGAN: In this instance, the staff has reviewed the use of the protocol that was developed to conduct that testing. We actually were fortunate enough to witness some of that testing, and that proved to be invaluable in the staff's review. So these are partial height assemblies, the remainder of the cross-section of the assembly was as described in the DCD. So that the review, the audits of the calculations and the supporting documentation is what the staff used to inform its review.

COMMISSIONER SVINICKI: Does the staff have the opportunity to see or input to these experimental protocols prior to the conduct of the test? So that if you had had concerns or suggested revisions to the protocol, you would have had an opportunity for that input, and did you have that opportunity in this case?

JOHN MCKIRGAN: As a generic issue, the staff doesn't generally pre-approve protocols like this.

COMMISSIONER SVINICKI: Okay.

JOHN MCKIRGAN: In the case of GSI 191, because of its history, the staff has worked very extensively to ensure that concerns are communicated very early. And so in this instance, we did have the opportunity to discuss the protocols, and again, witness the testing.

COMMISSIONER SVINICKI: Okay, thank you. And on the topic of

the squib valves, I'm thinking about the underlying phenomenology of concern there, in terms of development of the testing and inspection protocols. Are there other one-time use types of components that are required to have high reliability that we've looked at to inform this nuclear application? And what comes to mind for me there is perhaps use of certain explosive components in perhaps space or missile types of applications, or ejection booster seats in the military, things like that. Are there, is there a body of operational experience in, you know, non-nuclear but high safety and reliability applications that could be of use here in informing these inspection and testing requirements?

THOMAS SCARBROUGH: Well, Westinghouse is working with Copes-Vulcan to develop the squib valves. And they have brought in expertise from other industries and there the Goodrich company does propellants with quite a -- experience with this type of issue. And so, they've brought in -- and I think because of this new area for nuclear power plants, they have reached out and obtained resources and expertise from other sources as well. So, I think, you know, we are monitoring that as part of what we're doing in preparation for ITAAC inspections, we are monitoring the design qualification process with Westinghouse, with Copes-Vulcan, with Southern Nuclear to go through step-by-steps. And in their development of surveillance recommendations, as part of what they're doing, as part of their design qualification process. So they are reaching out and gathering as much expertise as they can from other sources.

COMMISSIONER SVINICKI: Okay, thank you. And just very quickly, on staff's slide four, there was discussion of the four percent damping instead of five percent and I just wanted to be certain that I understood. Is five percent more conservative than four percent?

BRET TEGELER: I can address that. Four percent is more conservative in that you're crediting less energy dissipation in the structural mechanical system So, if you're using lower values of damping, you're going to see a slightly higher response.

COMMISSIONER SVINICKI: Okay, okay, that intuitively makes sense. Thank you. Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Apostolakis?

COMMISSIONER APOSTOLAKIS: Thank you, Mr. Chairman. Do we have any idea how reliable squib valves are?

THOMAS SCARBROUGH: In terms of the experience we have through the current operating plants the boiling water reactors, they do use small squib valves for, you know, the stand by liquid control system. And so we have that experience. And then for the current design qualification process, they're going through a series of testing of varying different parameters of propellant mass and things of that nature, the dimensions to look at how reliable they are in terms of what their flexibility you have, in terms of the amount of propellant and things of that nature. So they're going through an extensive testing process.

COMMISSIONER APOSTOLAKIS: Do they blow up any?

THOMAS SCARBROUGH: Yes, they do.

COMMISSIONER APOSTOLAKIS: Okay, and do we have any idea what the reliability is, or is it nobody has found that?

THOMAS SCARBROUGH: Well, they test multiple times of testing them, so there's an extensive amount of data that they're gathering in terms of the amount, in how they test it, the amount of packing and things of that nature to make sure it's reliable in terms of the repetitiveness of being able to pack the charges and things of that nature. So, they're looking at a lot of those issues, because this is a new area for nuclear industry.

COMMISSIONER APOSTOLAKIS: Because I'm wondering, you said on slide seven, that surveillance activities would provide reasonable assurance of operational readiness. And I'm wondering, if you mean, by surveillance, you will look at those parameters you just mentioned that are within the established limits? Is that --

THOMAS SCARBROUGH: Well yes, what we feel is that, what's in the current OM code is insufficient for these types. The complexity of the design is much more than the simple ones that are used in the current reactors. And so there's more aspects, that's what we're talking about. Not only did you test the charges periodically, but also you look into terms of internal inspections to look for the internal condition of the actuator itself and things of that nature. Foreign material that might be gathered somehow, things like that could interfere with their operation. All those things are considering -- and that's part of what we told them. They have to complete as part of this design qualification process to develop recommendations of the types of

surveillance that would be appropriate.

COMMISSIONER APOSTOLAKIS: So all this has to do with availability, when I want it, is there such a thing as purely [unintelligible] of those? Would they explode when they're not needed?

THOMAS SCARBROUGH: Well, that is an area that the I&C people look at for spurious actuation, and part of the overall review of squib valves is the loads on the piping and things of that nature. And when they do actuate. So that is all part of the -- our engineering mechanics branch is looking at the piping loads and things of that nature for when these things, you know, explode.

COMMISSIONER APOSTOLAKIS: Thank you. Let's go to the seismic, Bret. First of all, on slide four, you say that above one Hertz there were no exceedances, below, there were some. But then you also said that if I look at the slide on the other panel, there are exceedances above 10 Hertz. What is this statement here, you're referring to what?

BRET TEGELER: Sorry, let me check that slide.

COMMISSIONER APOSTOLAKIS: Slide four. Are you dealing only with structures here?

BRET TEGELER: Oh, okay. The, correct. When I talk about exceedances above 10 Hertz, I'm referring to the free-field response. So it's the exceedance of the CSDRS by the GMRS. So, certainly in the free-field, a particle on the free surface at Vogtle site, there will be exceedances.

COMMISSIONER APOSTOLAKIS: Is this statement correct here?

That above one Hertz there were no exceedances?

BRET TEGELER: And so where this is, this sentence is speaking to, is in the in-structure, in the nuclear --

COMMISSIONER APOSTOLAKIS: Oh, the in-structure.

BRET TEGELER: I'm sorry, I wasn't clear on that. And so when you do the, when you performed the SSI analysis, the nuclear island is essentially a large vibration absorber filtering out the motion above 10 Hertz. So that's --

COMMISSIONER APOSTOLAKIS: What is about the exceedances above 10 Hertz? Somebody else, because of instrumentation, and things like that --

BRET TEGELER: In the case of Vogtle, they will have for a high frequency site, like a hard rock site, you'd be more concerned with that. In a case of Vogtle, they're not -- they're getting almost no energy above 10 Hertz, so anywhere in that structure, it's not going to be an issue for electrical components, as an example.

COMMISSIONER APOSTOLAKIS: Now, you found that the exceedances were not safety significant because there were no SSCs with resonant frequencies in this range below -- I mean, above 155 Hertz.

BRET TEGELER: Correct.

COMMISSIONER APOSTOLAKIS: Is that the general --

BRET TEGELER: No, we had to check. We did a check of the modal response of at least on the structural side of, were there significant structural modes in that area? And we determined that there were not typical piping package frequency of interest are much higher,

maybe five Hertz. And electrical, as you mentioned, even higher. When you talk about low frequency response, you're in the range of tank sloshing, tank -- loads on tanks. And for the AP1000 their tank sloshing frequencies, the fundamental frequencies are even lower than the .6. They're around the .15 Hertz range for the fundamental. And there are other high order ones, but that's the most mass participation is in the .13,.15 Hertz range. That's why we chose that exceedance to not be safety significant.

COMMISSIONER APOSTOLAKIS: Now, I'm just curious, what do the regulations say, that the GMRS should not exceed the CSDRS, or that if it does, you should demonstrate safety. I mean, what are the criteria?

BRET TEGELER: Well, the first check done for the COLA is what you just described, where you do a comparison in the free field with the site GMRS to the standard design CSDRS. If you're bounded, and there are site soil parameters are bounded also by the standard design, you essentially do not have to do any site specific SSI. In the case of Vogtle, they ran into a problem where they did have an exceedance. Now, the AP1000 has a provision that even if you do have an exceedance of their CSDRS, it talks about ways in which you would do your site specific analysis, and Vogtle followed that process.

COMMISSIONER APOSTOLAKIS: Would you say that as a result of all this evaluation, the seismic margins have been eroded a little bit?

BRET TEGELER: No, I don't think so. And the reason I say that is because -- and even though there was an exceedance in the free-field, again, that nuclear island is really a massive vibration

absorber. You're getting very little energy into the SSCs above 10 Hertz. And so there's quite a bit of margin. When you look at the in-structure, when you look at the comparisons of the --

COMMISSIONER APOSTOLAKIS: There is margin, but has it been eroded a little bit? I know there is margin.

BRET TEGELER: Yeah.

CHAIRMAN JACZKO: Like Jeopardy, we're going to put a little tick-tock in.

[laughter]

BRET TEGELER: Well, I'm not sure the mechanism that would erode the margin, because when I look at the comparison and response spectra, they're clearly enveloped by a standard design by a factor of almost two to three in most locations. And then I also know that the standard design has a margin over the CSDRS, and so that, when you say the reference point for an eroding margin, I'm thinking of the standard design and the fact that --

COMMISSIONER APOSTOLAKIS: Well, I mean compare to a plant or to a site where there would be no exceedances.

BRET TEGELER: There would be -- if there was a reduction in margin it would only be in that narrow frequency range where they have an exceedance. But again, judging that they don't have any significant components in that, the --

COMMISSIONER APOSTOLAKIS: So there is some reduction, it's very small, that's what you're smaller.

BRET TEGELER: Very small, correct.

COMMISSIONER APOSTOLAKIS: Okay. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Magwood?

COMMISSIONER MAGWOOD: Thank you, Mr. Chairman. Back to squib valves for a moment. I'm sorry, I found -- I appreciate my colleagues going through this, because I think we got good feedback from you about the situation and it sounds like we all have roughly the same sorts of questions. But, let me a bit more forward looking approach to this, is there anything that you can do in the way of testing or surveillance other than what you've already described? The test firings, the internal inspections, is there something else that, you know, the technical community is thinking about in terms of testing these valves that you haven't discussed?

THOMAS SCARBROUGH: Well, that was one reason why we specified, why we had been specifying in the SER that they incorporate the lessons learned from valve qualification, because the internal inspections and the foreign material, that was all coming out so far at a design qualification process. That was part of like, because originally the OM code says, you know, sample some charges. And once we were monitoring the design qualification process, we saw that the complexity indicates that we need to know more about the internals, and any foreign material, as part of that. So, we've already found some lessons learned, and those are some areas that we're thinking about making sure that are incorporated either in the OM code or specified in 55a when we incorporate by reference the OM code. Because we can add those requirements if the OM code does not do it themselves. So, those

are some things we're thinking about, but there may be others that we want to keep monitoring. We've been attending design review meetings, tests -- they're going to start actually testing flow testing squib valves in January, first of next year. So we'll be monitoring that and seeing what's going on in terms of what else might be appropriate for types of surveillance for these components.

COMMISSIONER MAGWOOD: So in other words, there's a test firing that's -- the way this development might come up, you're saying we have, there might be some protocol in test firing, some protocol on internal inspection. And then there's something else out there that right now, we don't know what that is. And that may be, some combination of those things, might be the answer a few years from now. Is that --

THOMAS SCARBROUGH: Yes, because we could have had them put specifics in the FSAR right now to say, look for foreign material, look for internal, but there may be something that comes out next year, that we want to have them do even more. And so, I didn't want to be too specific in the FSAR right now, because I want to give us some flexibility that next year, when we have ASME working on this, you know, we'll continue to monitor. Copes-Vulcan is looking at surveillance requirements. Once we bring in all those experts, we want to be able to come up with the best possible surveillance for these valves, and not just sort of pick something right now.

COMMISSIONER MAGWOOD: So barring some revelation, it's going to be some combination of protocols, test firing, and surveillance.

THOMAS SCARBROUGH: Right, yes sir.

COMMISSIONER MAGWOOD: So, I guess that's both good and bad news. Because it sounds like what you're saying is that we could have the definitive protocol. We could have done that now. But the staff is of the opinion there might be some better developments, so you're holding it open just in case there's something better. But you're not -- I'm wondering if you believe that what's available today is not good enough, or you think that --

THOMAS SCARBROUGH: It might be sufficient, once we, once the testing program is completed next year. What we were sort of thinking about now may be adequate, but I wouldn't want to say this is what the surveillance is going to be until we sort of see how the test program finishes up next year.

COMMISSIONER MAGWOOD: I guess I'm -- your dialogue with the Chairman is actually kind of interesting because it seems like there is a scenario where we get to a certain point in this process, and the staff would come back and say, we're not happy, we don't think it's a good solid test protocol, we can't start this, we can't allow this to start. Is that a realistic scenario based on what you know today?

THOMAS SCARBROUGH: I don't think we get to that point. Of probably all our operational programs, we might have that problem. Because all the operational programs, you know, are waiting until fuel loads. SO there's going to be some group of operational programs inspections that have to be dealt with. But, in this case, we already have some ideas, the industry knows they need to develop surveillance,

appropriate surveillance requirements for these. ASME is working on it, we're actually starting reviewing the 2011 addenda which begins the new reactor OM code improvements. We're going to be starting putting out ideas for that. So over the next year, there's going to be a lot of work, in terms of developing surveillance requirements for these. And so, I don't think we get to that point. If we got far enough down, we could -- if ASME did not put something in the OM code, we could put it in 55a when we incorporate by reference that edition of the code. So we could put it in there ourselves. But I want to have the industry to take the lead on this, because they're the experts in doing the testing right now. And then we can monitor that and make sure that we're comfortable with what their final recommendations are, and then endorse that in the code.

COMMISSIONER MAGWOOD: Let me give the applicant a chance. I don't know if you have some technical expertise at the table on this, if you wanted to opine or offer an observation.

WESLEY SPARKMAN: I don't know that I would say that I have technical expertise in it, but our perspective would be that we want to have the best tests available at the time as well. We do believe that what we -- what has been identified thus far, would be an acceptable test, if nothing else comes to light. But we want to have the opportunity to, if something else does come to light, to consider that for implementation.

COMMISSIONER MAGWOOD: Okay. Well, I think, I appreciate -- I think everybody's understanding where you're coming from. So, it

wouldn't be fair to ask the question, how do we get to this point and still have this question open? Because you're leaving this question open somewhat on purpose. Is that a fair statement?

THOMAS SCARBROUGH: Yes sir, because we have -- they have to incorporate by reference the OM code 12 months before fuel load; we have that, we have the FSAR, we have the operational program inspections. We have a lot of safety nets here to make sure that before fuel load, they have an acceptable surveillance program for squib valves. So, we're sort of intentionally letting them complete some more of the design qualification testing before we establish final what the surveillance requirements would be for squib valves.

COMMISSIONER MAGWOOD: Mr. Chairman, I just have one quick, what I think is a quick, question on slide four, which Commissioner Apostolakis spent some time on. We were talking about this, the damping, and where did those numbers come from? Are those externally derived numbers?

BRET TEGELER: These values are informed through past experiments, they're at a regulatory guidance, at 1.61 in particular. And the four percent is representative of an OBE type operating basis earthquake level of damping, in which you have, it's not a -- it is a severe seismic event, but it's not severe enough to cause high stresses in structures. So, as opposed to an SSE level event, where you are going to, you are approaching a fairly high level of stress, so you're, it's an attempt to try to make a -- your damping level commensurate with a level of stress in the analysis. Now the five percent, of course,

there's a material dependence here; reinforced concrete will have one value, seven percent, shield building uses five percent for SSE level. The applicant, or Vogtle, chose to use four percent across the board, which is a fairly conservative assumption, given that they could have used five percent at some locations. So that's the purpose of that bullet.

COMMISSIONER MAGWOOD: Excellent, thank you very much. Thank you Chairman.

CHAIRMAN JACZKO: Commissioner Ostendorff?

COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman. I want to continue just a little bit on squib valve discussion. I found it very interesting that ballistic missile submarines, they use those in some applications for almost 50 years. So I'm a little surprised that there appears to be a -- I'm interpreting a little bit of a vacuum about how to test these things. Let me ask you a couple questions here. We have squib valves, I'm not familiar with the technology, used in existing BWR's. Is that, but there are some squib valves?

THOMAS SCARBROUGH: There are some small squib valves used in a stand by liquid control system.

COMMISSIONER OSTENDORFF: Are the designs of the AP1000 squib valves fundamentally different?

THOMAS SCARBROUGH: Fundamentally different. And much larger.

COMMISSIONER OSTENDORFF: Okay. Do the existing smaller different valves for BWRs, are they subject to some kind of in-service

testing program?

THOMAS SCARBROUGH: Typically, the OM code specifies for those that every outage they remove 20 percent of the charges and test fire them separately in a lab. And then if any of those failed, then they pulled the whole batch out and replace those. And that's been an acceptable OM code for these small squib valves, simple squib valves used in the current reactors.

COMMISSIONER OSTENDORFF: Okay. Got it. All right, let me go, Bret, your slide three: Bottom bullet talks about the NI-15 system for analysis of a soil structure interaction? I'm just not familiar with that, is that a system, a modeling system, that's been around for some period of time or is that new and unique to the AP1000?

BRET TEGELER: Yeah, my apologies, I may not have been that clear on that. It is a, the NI-15 model, it's really a, it's not a code per se. It's really just a term to finding the analysis model. The structural model, you can imagine, is comprised of elements on the order of about 15 feet in size. So, the characteristic element model for this 3-D shell model is about 15 feet. And the significance of that is the ability of that model to have bandwidth to pass higher frequency responses into the structure. So, we, or the applicant, refer to that model as the NI15 model.

COMMISSIONER OSTENDORFF: Is this model, or one closely associated with it been used previously by the NRC?

BRET TEGELER: The, I'm going to throw another, an NI20 model at you now, that is the design basis model. That's the model that

Westinghouse developed, which is also a 3D shell model. And it has a characteristic element size of 20 feet, a little larger. So, you're not going to be able to pass as result high frequency motion as well. So, again, Vogtle chose to refine this model. And the refinements aren't everywhere, it's mostly at elements, or locations below grade to get higher frequency soil input into the structure. So it is -- these are SASI models, SASI is a soil structure interaction analysis code in which the NI-15 model, which is a structural model that's placed in the soil media then analyzed for the ground motion at the Vogtle site.

COMMISSIONER OSTENDORFF: Is that kind of model used elsewhere by the federal agencies doing similar work?

BRET TEGELER: Yeah, this type of model is very, I'll call it -- particularly now it's standard practice, most of the applications we've been seeing now are using 3D SASI type models, just like Vogtle used, and what AP1000 used. So it is, I'll say, typical of what we're seeing these days for seismic analysis in nuclear plants.

COMMISSIONER OSTENDORFF: Thank you, that's very helpful. John, I want to ask you one question here. On your slide 12 and 13, control room habitability, toxic gas monitoring, at a big picture level, is there anything significantly different about the Vogtle application as far as toxic gas or habitability compared to our existing power plants?

JOHN MCKIRGAN: No.

COMMISSIONER OSTENDORFF: Okay.

JOHN MCKIRGAN: Is that too brief?

COMMISSIONER OSTENDORFF: Nope, that's good.

[laughter]

CHAIRMAN JACZKO: No.

COMMISSIONER OSTENDORFF: Thank you, and thank you, Mr. Chairman.

CHAIRMAN JACZKO: Any other questions or comments from anyone else? Okay, thank you very much for your presentations. We will -- are we taking a break?

FEMALE SPEAKER: Yeah.

CHAIRMAN JACZKO: Okay, quick break.

(Whereupon, a short recess was taken)

CHAIRMAN JACZKO: Okay so we will now finish our last panel for the day. Will be a discussion of Chapters 7, 8, 15 and 19 and the relevant sections of the application, and these chapters touch on issues like off-site power, probabilistic risk assessment and digital instrumentation and controls. Again, if I could just ask everyone to repeat, state their names.

AMY AUGHTMAN: Amy Aughtman, Southern AP1000 licensing supervisor.

DONALD MOORE: Don Moore, Consulting engineer, Southern Nuclear.

WESLEY SPARKMAN: Wes Sparkman, COL licensing supervisor, Southern.

EDDIE GRANT: Eddie Grant, AP1000 Licensing Support Lead, NuStart.

LYNN MROWCA: Lynn Mrowca, chief PRA and severe accidents branch, Office of New Reactors.

MARK CARUSO: Mark Caruso, senior reliability and risk analyst, Office of New Reactors.

RAVINDRA JOSHI: Ravi Joshi, senior project manager, Office of New Reactor.

DENISE MCGOVERN: Denise McGovern, project manager, Office of New Reactors.

CHAIRMAN JACZKO: Do you want to start this?

WHEREUPON,

the witnesses for Southern Nuclear Operating Company and for the staff of the Nuclear Regulatory Commission, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:

WESLEY SPARKMAN: All right, thank you. As you stated, this panel covers selected safety items from Chapters 7, 8, 15 and 19. Go to the second slide please. In this presentation Don Moore will begin by covering seismic margin analysis for the Vogtle site. I will then take over the presentation to discuss other external events covered in Chapter 19 and a discussion of a loss of large areas of the plant due to explosion or fire, our submittal for that, and then Eddie Grant will then take over reactor power uncertainty measurement and DCD I&C key information by reference and then finally Amy Aughtman will take over off-site power system and underground cables. Next slide please.

I'll turn it over to Don.

DONALD MOORE: Good afternoon, I will present a brief overview of the seismic margin assessment performed for the Vogtle COL with the Chapter 19, 19.55. A comparison was made to the standard plant seismic margins assessment, thus the AP1000 standard margin assessment in regards to seismic stability and design of the nuclear island -- seismic design of the nuclear island. The Vogtle nuclear island safety margins against sliding and overturning were demonstrated to be greater than the limiting safety factors calculated for the standard AP1000 design cases, also as previously discussed a Vogtle site specific seismic demand is enveloped by the AP1000 seismic demand used for design. It is therefore concluded that the AP1000 seismic margin assessment is applicable to the Vogtle site and therefore the Vogtle SMA for seismic stability and seismic design is demonstrated by this comparison. The review level of earthquake for a margin assessment for the Vogtle site is defined as 1.67 times the Vogtle GMRS. That gives you a peak ground acceleration of .44Gs. The following soil related failures were evaluated and screened out basically on -- based on sufficiently high margins, these are site specific failure modes that are -- have to be evaluated on a site specific basis and this is soil liquefaction and soil bearing failure. Engineering evaluations were performed and that demonstrated that the seismic margins against soil failure due to soil liquefaction and soil bearing were well above the review-level earthquake. Therefore, they were screened out for the review level earthquake and based on these assessments the Vogtle seismic margin assessment requirements are fully met. Now I'd like to

turn it over to Wes Sparkman who will present the next slide on other external events. Thank you.

WESLEY SPARKMAN: Thank you Don. Excuse me. FSAR Table 19.58-201 documents the site specific external events evaluation that has been performed for the VEGP units three and four site. This table provides a general explanation of the evaluation and resultant conclusions and provides a reference to applicable sections of the COLA, where more supporting information, in other words including data used, methods and key assumptions, regarding a specific event is located. Included in the slide are general areas that were evaluated. No site specific susceptibilities were identified in this evaluation. Where standard plant analyses are provided the standard plant analyses were shown to be applicable. Based upon the evaluation performed it is concluded that the VEGP units three and four site, is bounded by the high winds, floods and other external events analysis documented in DCD section 19.58 and APP-GW-GLR-101, no further evaluation are required at the COL application stage. Next slide please.

I will now discuss our loss of large areas of the plant submittal. In early 2009, the commission codified the requirements for mitigation of events involving loss of large areas of the plant due to explosions or fire, otherwise known as LOLA. 10 CFR 50.54 hotel, hotel two codified the requirements to develop and implement guidance and strategies intended to maintain or restore core cooling, containment and spent fuel pool cooling under LOLA conditions. These requirements are essentially the same as those imposed on the operating reactors by the

interim compensatory measures order section bravo five bravo in February of 2002. In May of 2009 Southern Nuclear submitted the Vogtle units 3 and 4 LOLA mitigative strategies description and plans for implementation document. It is our understanding that this was the first MSD submitted in accordance with the requirements of 10 CFR 50.80 delta. As discussed in the response to the Commission's pre-hearing question number 31, the VEGP three and four MSD was based on 52.80 delta template in NEI-0612 revision three. To the extent possible, for phase one of the requirements, VEGP three and four MSD addresses phase one responses and strategies from units one and two and leveraged those B.5.B phase one responses as much as possible. With respect to phase two, the B.5.B phase two spent fuel pool cooling strategies for one and two are based on 0612 revision two, however, the AP1000, which is for units three and four, spent fuel make up and spray strategies are facilitated by the AP1000 design features including a hard piped redundant spray system to provide makeup and spray to the pool, gravity-driven sources of makeup spray -- makeup and spray cooling water; and external hard-piping connections for independently powered portable pumps.

And our Phase II and Phase III evaluations were based on NEI-06-12 Revision 3. Phase III of the LOLA mitigative strategies is intended to restore or maintain core and containment cooling in order to mitigate potential damage to the fuel and the reactor system and to mitigate potential radiological releases through the containment walls or other release pathways. The revised guidance in NEI-06-12 Revision 3

include a new chapter 4, which recognizes that some new plant designs employ passive features and may be evaluated differently for LOLA effects. Passive features and other design features, such as in-containment passive systems to provide long-term core cooling and decay heat removal simplify the approach of addressing the key safety functions for the AP1000.

The guidance provided in NEI-06-12 Revision 3 was endorsed by -- for use in ISG-16 in June 2010. The ISG provided additional guidance for meeting the staff's expectations for LOLA mitigation. The additional guidance includes items like equipment tagging, fire brigade equipment staging, command and control, equipment allowed outage times and equipment maintenance, many of which were addressed in RAIs issued during the staff's review.

Next slide, please.

Because to the VEGP 3 and 4 MSD was the first LOLA MSD written based on the new template Revision 3 of NEI-06-12 and the first submitted under 10 CFR 50.80 delta. And because the NRC's supplemental guidance in ISG-16 was not issued until the staff's review was well under way, SNC received a number of requests for additional information for details on the planned approach to implementing the mitigative strategies, as well as commitments to address the additional topics identified in ISG-16.

In the responses to the to these RAIs, SNC committed to a number of additional future actions that cannot be accomplished until the facility is near completion and the LOLA procedures and guidance are

ready for implementation. These commitments are discussed in SNC's response to the commission's pre-hearing question, number 31.

As discussed previously, the AP1000's passive design and other design features factored heavily into the 50.54 Hotel, Hotel II assessment and the determination of LOLA mitigative strategies. Several of the more important design features for this assessment include: a permanent hard-piped spent-fuel pool spray system that includes two headers, each with 16 spray nozzles on opposite sides of the pool; ground-level external hard-piped connections to the spent-fuel pool spray and makeup piping. These connections are designed for a fire department pumper truck or a portable pump to be connected directly to these hard-piped systems.

In addition, there are numerous alternative diverse water systems, one of which is the passive containment cooling water storage tank located above the containment structure. This tank provides the ability to makeup or spray by gravity flow to the spent-fuel pool without the use of pumps.

In addition to the AP1000 passive features discussed previously, it is important to note that the AP1000 design does not require the use of alternating current power for the initial 72 hours following a LOLA event for the protection of the core. This facilitates the LOLA response by eliminating the need for emergency diesel generators or other AC sources during this critical period of time. In addition, by using the ground-level connections, water can be pumped either to the PCCWST or to the spent-fuel pool.

Although LOLA mitigative strategies are not an operational program per se, as defined in the SECY-05-0197, they will be developed and implemented, following the same process, and strategies will be maintained using the regulatory commitment tracking program once the units are placed into operation. And there's a license condition which requires periodic updates and submittal of an implementation schedule, NRC pre-implementation inspection audits and LOLA strategies, which would be fully implemented prior to initial fuel load.

Next slide, please.

I will now turn the presentation over to Eddie Grant to discuss reactor power uncertainty measurement.

EDDIE GRANT: Thank you, Wes.

A reactor power calorimetric uncertainty at 1 percent is evaluated in Chapter 15 of the DCD. Each appropriate evaluation is incorporated by reference into the COLA at FSAR Section 15.0. Additionally, DCD Section 15.0 contains a COL information item, number 15.0-1, to verify that the installed instruments will provide the required 1 percent uncertainty. The COLA addresses this uncertainty by indicating in FSAR 15.0.3.2 that the instrumentation is verified to meet the analysis assumptions after installation. The instrumentation is laboratory calibrated prior to installation and in-place tested after installation.

Additionally, administrative controls are provided to implement contingency activities such as for failure of the instrumentation related to the power calorimetric instrumentation and to

provide for proper maintenance of the instrumentation. This commitment is also supported with plant-specific ITAAC on the instrumentation, installation and analysis. Additionally, the staff is proposing a license condition per their SECY COL draft to provide for submittal within one year after issuance of the COL of a schedule that identifies the expected availability of the documentation of the analysis for verification of the installed instrumentation uncertainties and for the expected availability of the procedures for maintenance and for contingencies. This schedule information is expected to be used by the NRC staff to schedule their inspections of the documentation.

Finally, we were requested to address the related power measurement uncertainty recommendation made by the ACRS in their letter of January 24, 2011. In response to this recommendation, the FSAR Section 15.0.3.2, as mentioned earlier, was revised to include an explicit commitment to perform the calibrations with representative piping configurations and to conduct the in-plant confirmatory tests.

The next slide brings us to Chapter 7 topics. We were requested for Chapter 7 to discuss key information incorporated by reference from the DCD that was related to the instrumentation and controls addressed in Chapter 7. Practically the entire chapter is incorporated by reference from the DCD in the FSAR. The COLA FSAR contains only information on confirming set points and a few site-specific post-accident monitors, or PAMs, for radiation monitoring at the site boundary and for meteorological data. Some of the key instrumentation and controls addressed by the DCD include, of course,

the reactor controls and also the controls for actuation of engineered safety features, including diverse actuation controls for both of these systems.

And now Ms. Aughtman will wrap up this panel by discussing Chapter 8 topics.

AMY AUGHTMAN: Okay, thanks, Eddie.

This slide covers the overview of offsite power and the one departure taken in Chapter 8. In terms of an overview of the offsite power system, there are three high-voltage switchyards for all four units on site. There is one 230/500 kV switchyard for units one, two and three; a 500 kV yard for unit four and a 230 kV reserve auxiliary transformer supply yard for units three and four. Hopefully that gives you a little bit of a visual for the layout of all four units.

The DCD identified three interface areas for COL applicant action, each of which are addressed in FSAR Section 8.2. Additionally, through the course of the NRC's review, a standard plant-specific ITAAC, comprised of six design commitment elements, was established for offsite power.

The departure taken in Chapter 8 is related to the class 1E voltage regulating transformers. This departure is simply to clarify DCD language to make it more clear that the AP1000 voltage regulating transformers do not have active components to limit current since the isolation and protection function is provided by circuit breakers.

Last slide.

Finally, underground cables were requested to be discussed

here. The FSAR actually addresses this discussion in FSAR Section 17.6 as part of our maintenance rule program description, which also incorporates by reference the NEI program description. The cable condition monitoring program incorporates lessons learned from industry operating experience, addresses regulatory guidance and utilizes design information to determine the appropriate inspections, tests and monitoring criteria.

This program also considers the information contained in generic letter 2007-01. And that concludes our presentation for Safety Panel 3.

CHAIRMAN JACZKO: Thank you. We'll have the staff --

DENISE MCGOVERN: Good afternoon. In this panel, we will be presenting SER Chapter 19, including the novel issue related to the review of the loss of large area of the plant due to explosions or fires, also known as LOLA. This panel will also address Chapters 15, 7 and 8. I will be presenting Chapter 19 and 7. Joining us at the table are Mark Caruso and Lynn Mrowca, who will present the LOLA review; and then Ravi will present Chapters 15 and 8.

Slide two, please. Oh, never mind -- back one slide.

I will begin with the Vogtle Chapter 19, "Probabilistic Risk Assessment," or PRA, and severe accidents. We will start with the information incorporated by reference from the AP1000 DCD and then address the plant-specific information from the COL application.

Slide, please -- three, please.

The AP1000 DCD chapter covers severe accidents and PRA. The

aircraft impact assessment is also discussed in this chapter of the DCD. 10 CFR 50.150 requires design certification applicants to perform an assessment of an aircraft impact upon the facility. A COL application like Vogtle's does not need to address this issue if it references a design certification that does so. The rule requires that a DC applicant identify and incorporate into the design those design features and functional capabilities to show that the reactor core remains cool or the containment is maintained and spent-fuel cooling or integrity remain intact.

The DC application must describe the features if the detailed assessment itself is not submitted. The staff reviewed the design certification amendment application using the approved review guidance in NEI 07-13 to determine if the rule requirements were met.

Next slide, please.

This slide lists the design features credited for the AP1000 aircraft impact assessment. The staff also performed an inspection at Westinghouse to examine their assessment and supporting calculations. The staff determined in its AP1000 DCD FSER that the rule requirements were met. Accordingly, it was not necessary for the Vogtle COL applicant to separately address the provisions of 10 CFR 50.150.

Next slide, please.

As you've seen previously, this table provides an overview of the scope of the staff's review for Chapter 19. In the next slides, I will summarize the staff's review of the plant-specific information, namely the seismic margin analysis and consideration of external events.

The site characteristics are evaluated during the ESP process. Consequences of external events are evaluated in other chapters of the safety evaluation. To be certified, a new reactor design must cope with any external event that occurs as frequently as once every one million years. In Chapter 19, we look at the same site and the same events, but this time we do it from a risk perspective.

Multiple failures occur during events that are expected to occur, and this contributes to risk. In addition, we must consider risk from events that occur less frequently than $1x10^{-6}$ per year. PRA begins with internal events occurring when the plant is at power. But that's only part of the story. For a clear picture of total plant risk, we must look at risk while the plant is shut down, risk from fire and flooding and risk from various external events. Whether they are natural or manmade, external event risks can only be addressed hypothetically in the AP1000 DCD. External event risks will be different at each site, so we must revisit external events for each COL, even when it references the certified design.

I will start with earthquakes. Slide five, please.

The magnitude of an earthquake concerns us only indirectly. We really care about how much the plant structures, systems and components shake. The energy of the earthquake dissipates as it travels through the earth's crust and must then be transmitted through the soil column between the crust and the plate. The red line on this figure shows the certified seismic design response spectra for the AP1000 or CSDRS. That's the shaking that results from a safe shutdown earthquake,

or SSE. We say that the SSE is a 0.3G earthquake. This is shorthand for acceleration spectra that are shaped like the CSDRS pinned to that little green dot, 0.3G at 100Hz on the right side of the graph.

The site-specific ground-motion response spectra for Vogtle is the dark line, and you can see that it exceeds the CSDRS at very low frequencies and over most of the range from six to 60Hz.

Next slide, please.

In the staff requirements memorandum for SECY-93-087, the commission directed the staff to assess seismic events using a PRA-based seismic margin analysis. The commission said that the review-level earthquake with be a 1 2/3 as strong as the safe shutdown earthquake -- that's a 0.5G earthquake -- during which the equipment needed to shut down safely must function with a high probability in low consequence of failure.

Because the response spectra at the Vogtle site are greater than the CSDRS, at least for some frequencies, the COL applicant had to show adequate margin based on the higher spectra. To determine whether the design is sufficiently robust, the next step is to determine the local motion -- seismic acceleration at specific points within the plant. The Vogtle analysts developed a detailed dynamic model of the plant and use the SSE as input to develop the accelerations that will be experienced by the seismically qualified SSEs.

For AP1000, these in-structure response spectra, or ISRS, were calculated for six key locations that are used to determine how much a component will shake at a particular spot. ISG 20 provides

interim staff guidance on implementing seismic margin analysis. Consistent with this guidance, Vogtle developed ISRS for the same key locations that had been analyzed for the AP1000 DCD. The site-specific results were close to the ISRS for the generic design, exhibiting no more than 10 percent exceedance in any case and then only at frequencies too low to be of concern for AP1000 SSCs.

The applicant concluded that the seismic margin analysis performed by the DC amendment remains applicable to Vogtle. The staff's evaluation of this analysis was based on guidance in the standard review plan and ISG 20. The staff audited the detailed calculations as part of the ESP review and limited work authorization process and concluded that the generic seismic margin analysis remained applicable to the Vogtle site. Since the AP1000 generic design has adequate seismic margin, the COL applicant has demonstrated that the Vogtle units three and four will have adequate seismic margins.

Next slide, please. I think we should be on slide seven -- oh, I'm sorry, we should remain on seven.

MALE SPEAKER: [Inaudible.]

DENISE MCGOVERN: I'm sorry?

MALE SPEAKER: [Inaudible.]

DENISE MCGOVERN: I went ahead? We're good now. Slide seven.

Risk from seismic events and local geology are not the only site-specific considerations. Other external events must also be considered for potential contribution to the risk profile of the plant.

For AP1000 COLs, high winds, flooding, fire, transportation accidents and hazards from nearby facilities must also be evaluated. Westinghouse took the approach of polling the potential AP1000 COL applicants and tried to select the most limiting external event of each type. From these, Westinghouse created a generic site profile. In this way, each COL applicant would only have to demonstrate that the conditions at their proposed site are bounded by those conditions of the generic site profile.

Initially, the COL applicants in the AP1000 design center offered a standard supplement, asserting this position. However, the staff required each COL applicant to provide a site-specific supplement. SNC had to describe the magnitude and frequency of natural and manmade hazards at the proposed site. In this way, the staff was able to make an independent assessment. If the COL applicant demonstrates that an external event for its site is bounded in both magnitude and frequency by the same external event for the generic site, the associated risk has been already assessed in the DCD, and it need not be evaluated further.

In addition, if it can be shown that a particular external event will not contribute to the core damage frequency, or CDF, in any significant way, there is no need to describe it as part of the total plant risk, and it is screened from further analysis. This screening is appropriate, because even though the CDF for AP1000 internal events at power is so low -- less than 3×10^{-7} per year -- rare events still have the potential to affect CDF.

For AP1000, the ground rules for external event screening are

part of the certified design. If an event is more frequent than $1x10^{-6}$ per year, the plant must be designed to withstand it. If an event is more frequent than $1x10^{-7}$ per year, then its contribution to CDF must be calculated. If this delta CDF is less than $1x10^{-8}$ per year, its consequences are negligible and it need not be further evaluated. But if the frequency is less than $1x10^{-7}$ per year, its frequency -- it is negligible and it need not be further evaluated. Otherwise, the risk from the event must be included in the results from the risk analysis that I've reported in the FSAR.

This table shows how each of the external events was screened. I'll provide a little more detail on how the applicant made each case.

For winds, the design basis of the AP1000 safety-related structures is a load from a 300-mph tornado. The staff has issued guidance to the effect that the continental United States winds of 230 miles per hour do not occur more frequently than $1x10^{-7}$ per year. However, wind speeds are less likely, so their contribution to risk is negligible. All other categories of tornado have event frequencies that are bound by those used in the DCD.

The applicant made the same case for hurricanes, extra-tropical cyclones or storms with winds less than 74 miles per hour. For Vogtle, they may be more frequent than assumed in the DCD, but the switchyard and all structures of the AP1000 are designed to withstand them without damage.

With respect to flooding events, Vogtle's plant grade is 220

feet above mean sea level. The design basis for flooding from the Savannah River is the result of cascading upstream dam failures coincident with wind setup and wave run-up. This flood is more than 40 feet below plant grade. The probable maximum precipitation event, as calculated in Chapter 2 of the applicant's FSAR comes close to the plant grade, but the conservatism in this calculation led the staff to agree with the applicant's conclusion that it is a bounding analysis. Unless an external flooding event can reach the plant grade, it can have no consequence on safety-related structures and is screened out.

Transportation accidents were either bounded by the frequency and consequence used in the DCD; not applicable at all, as in the case of marine transport; or they had no significant consequence. Onsite storage tanks of potentially hazardous materials were assessed in accordance with the regulatory guide for potentially explosive or flammable vapors. Hazardous chemicals were evaluated in accordance with the guidance on control room habitability. The staff agreed with the applicant's determination that external fires cannot approach the plant closely enough to challenge safety-related structures. A fire at an offsite industrial facility was also considered.

Finally, the applicant addressed radiological hazards from other nuclear facilities on the site. Using conservative assumptions, the consequence of a LOCA at Vogtle unit one or two is comparable to a LOCA in unit three or four and remains within the control room habitability limits of GDC 19. So such events would not be expected to contribute to CDF. Staff concluded that the applicant has addressed all

external events applicable to Vogtle units three and four and provided a sufficient basis for screening these external events from further evaluation.

And now Mark will continue with the Chapter 19 and the presentation on loss of large areas of the plant due to explosions and fires.

WHEREUPON,

MARK CARUSO

was called as a witness for the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

MARK CARUSO: Thank you. Good afternoon. My name is Mark Caruso. I'm a senior reliability and risk engineer in the Office of New Reactors. I was technical lead in the Office of New Reactors for developing guidance for staff review of LOLA mitigation strategies submitted by applicants for a combined license. And by LOLA, I mean loss of large areas of the plant due to explosions or fires.

At the table with me is Lynn Mrowca, chief of the PRA and Severe Accidents Branch in the Office of New Reactors, which has primary responsibility for Vogtle LOLA review. Additional supporting witnesses seated to the right would be Dennis Andrukat and Eric Powell. Dennis is a member of the fire protection team in the Office of New Reactors and handled fire protection issues in the Vogtle 3 and 4 LOLA review. Eric Powell is a reliability and risk engineer in the Office of New Reactors, PRA and Severe Accidents Branch.

Eric, along with myself and Glenn Kelly, who has since retired from the agency, was principal reviewer of the treatment of LOLA in the Vogtle application. In this presentation, the staff will summarize its evaluation of information provided by the applicant regarding how Vogtle will satisfy the requirements of 10 CFR 50.54(hh)(2). We will discuss guidance the staff finds acceptable for satisfying the applicable NRC requirements and the scope and depth of review the staff has done to obtain reasonable assurance that the applicant has adequately satisfied the guidance and provided sufficient information, including commitments made with revised application to meet the requirements of 10 CFR 52.80(d). This provides reasonable assurance that the requirements in Section 50.54(hh)(2) will be met.

The provisions of section 50.54(hh)(2) require nuclear power plant licensees to develop and implement guidance and strategies for addressing the loss of large areas of the plant due to explosions or fires from a beyond-design-basis event. Specifically, licensees must develop and implement guidance and strategies intended to maintain or restore core cooling, containment and spent-fuel pool cooling capabilities under the circumstances associated with a LOLA. These requirements are based on similar requirements originally found in Section B5B of the NRC's Interim Compensatory Measures Order issued February 25, 2002, which I will refer to as the ICM Order.

Section 52.80(d) requires that an application for combined license contain a description and plans for implementation of the guidance and strategies required by Section 50.54(hh)(2). The

strategies and guidance required by Section 50.54(hh)(2) are considered similar to those operational programs for which a description of the program is provided as part of the combined license application and subsequently implemented before plant operation.

The development of strategies and guidance is performed by the applicant at the combined license application stage. The results of the activity are provided in the application. Staff reviews the results as part of the licensing process to determine if the applicant has provided reasonable assurance that the requirements in Section 50.54(hh)(2) will be met prior to initial fuel load.

Detailed development of strategies and guidance and implementation via operating procedures and associated basis documents is performed prior to initial loading of the fuel into the reactor. Staff will inspect implementation of the strategies and guidance in Vogtle prior to initial loading of fuel in the reactor.

Could I have Slide 11, please.

The staff's review is based on guidance in design certification, combined license, interim staff guidance document number 16, which I will refer to as ISG 16. Comments on the draft version of the ISG provided by the nuclear industry in November of 2009 are reflected in ISG 16. ISG 16 identifies guidance from three primary guidance documents for use in developing and implementing strategies and guidance required by Section 50.54(hh)(2).

The first document consists of safeguards information issued to current reactor licensees by the commission on February 25, 2005.

The second document provides further clarifying safeguards-level guidance issued in January of 2006 and included in NRC temporary instruction 25.15.168. The third is NEI-06-12 Revision 3, an industry guidance document endorsed by the NRC in ISG 16.

In addition to identifying these guidance documents, ISG 16 contains additional guidance for new reactors not contained in any of these three documents. The guidance issued by the NRC on February 25, 2005, and in January of 2006 addressed firefighting and specific operations for mitigating fuel damage and minimizing the release of radioactivity from the containment. Guidance for developing strategies for maintaining and storing core cooling, spent-fuel pool cooling and containment capability is contained in NEI-06-12, as I will discuss in more detail.

The NEI -- excuse me, the NRC endorsed NEI-06-12 Revision 2 in 2006 as an acceptable means for developing and implementing the mitigation strategies requirement in the ICM order. NEI-06-12 Revision 2 provides guidance for implementing a set of strategies intended to maintain and restore core cooling containment and spent-fuel pool cooling capabilities under the circumstances associated with a LOLA in several areas, namely adding makeup water to the spent-fuel pool, spraying water on the spent fuel, enhanced initial command-and-control activities for challenges to core cooling and containment, enhanced response strategies for challenges to core cooling and containment.

The specific strategies covered in the NEI-06-12 Revision 2 were developed based on the results of assessments conducted at

currently licensed power reactor facilities. These assessments were for the purpose of enhancing plant-specific mitigation capability for damage conditions caused by a large explosion or fire. NRC staff observed each of these assessments. The specific strategies covered in NEI-06-12 Revision 2 are informed by the results of Classified and Safeguards studies performed by the NRC as a result of interaction between the NRC and the nuclear industry following the issuance of the ICM order.

The NRC staff reviewed several draft versions of NEI-06-12 Revision 2, and our comments are reflected in the final version endorsed by the NRC.

Revision 3 of NEI-06-12 includes the guidance approved for the implementation of NEI-06-12 Revision 2 at current operating facilities. In addition, Rev 3 provides guidance and the reporting template for new power plant applicants and licensees to assist them in complying with the requirements in Section 50.54(hh)(2) and in Section 52.80(d). Indeed, Rev 3 of NEI-06-12 provides additional general guidance for developing strategies that utilize unique design features in new reactors such as passive core cooling systems, physical separation of redundant safety features and robust fire barriers.

The NRC staff reviewed several drafts of NEI-06-12 Rev 3, and our comments are reflected in the final version endorsed by the NRC.

A team of individuals knowledgeable and experienced in matters pertaining to LOLAs was assigned to the Vogtle LOLA review. The team included two individuals, Glenn Kelly and myself, who were members of the original task force assigned to review implementation of the ICM

order at operating reactors. We participated in NRC independent assessments of strategies for maintaining or restoring spent-fuel pool cooling at operating plants, NRC oversight of industry efforts to develop strategies and guidance to address LOLA events at operating plants and technical review of actions on the part of licensees to close out Phases II and III of implementation of the ICM order.

We also contributed to the development of guidance for these activities and were members of the NRC team that reviewed NEI-06-12 Revisions 2 and 3 as they were developed.

In addition, two members in the Vogtle LOLA team, Dennis Andrukat and myself participated in the development of guidance for complying with the aircraft impact assessment rule in 10 CFR 50.150 in the staff's procedures for inspecting the aircraft impact assessments.

Can I have slide 12, please?

The staff issued more than 90 requests for additional information to the applicant pertaining to a LOLA review. This large number of questions was a result of the applicant submitting that portion of its combined license application that addresses LOLA requirements prior to the staff completing its guidance for submitting information to address LOLA requirements, including guidance on the necessary level of detail.

The questions that were asked of the applicant generally resulted in three types of responses: clarifications, commitments and significant changes. Questions that resulted in clarifications generally asked the applicant to provide more detail about a mitigative

strategy in order for the staff to ensure the adequacy of the proposed strategy. For example, the staff asked for clarification about the specific locations or equipment; for example radios, portable pumps, firefighting equipment, will be stored and mustering locations for onsite and offsite responders.

Questions resulting in commitments asked the applicant to provide a commitment to perform an action that was best taken closer to the completion of Vogtle but prior to initial fuel load. For example, the applicant was asked to commit to include details in plant procedures and guidance for fire brigade staging and dress-out areas, to perform pre-operational tests and to label LOLA-specific equipment as such.

Finally, in some instances, staff questions resulted in significant change in the mitigative strategy in the application that was submitted by the applicant. For example, as I will explain in greater detail later in the presentation, a significant change was made to the spent-fuel pool cooling strategy in Vogtle's application as a result of questions asked by the staff. Many of the questions resulted in the applicant making revisions to the application that was initially submitted.

The staff’s safety evaluation is documented in the final safety evaluation report as appendix to Chapter 19 of the report. Appendix 19A contains the following: a summary of information provided by the applicant in accordance with Section 52.80(d), the regulatory basis for the staff's review, a description of the staff's evaluation, a description of the associated plant-specific license conditions and

expected post combined license activities and the staff's overall conclusion. The detailed descriptions of the applicant's strategies and guidance and the details of the staff's technical review of the strategies and guidance are included in the attachment to Appendix 19A. The information in the attachment is sensitive and unclassified non-safeguards information, which is withheld from the public under 10 CFR 2.390(d).

This format is similar to the format of safety evaluation reports that document the staff's bases for concluding that licensees for operating reactor facilities complied with the ICM order and now comply with 50.54(hh)(2).

I will now summarize the staff's review of several important issues. NRC inspections for compliance with the ICM order at licensed power reactor facilities in 2008 have shown that to successfully implement some mitigation strategies, diverse pieces of equipment such as fire hoses or electrical devices that may not regularly be connected or tested must be connected.

The inspection has also revealed that the quality of procedures in performing these operations varied widely. In light of the information from these inspections, the staff ensured that the applicant had a plan to perform a walkthrough, either by simulation or actual performance of the step -- of the steps in each procedure to provide assurance that the procedure implemented the strategy correctly and the steps could be accomplished in the time required.

Also during inspections at licensed power reactor facilities

in 2008, the NRC staff found that some licensees had not established a maintenance program for equipment relied upon to implement mitigative strategies. With that in mind, the staff ensured Vogtle's application discussed maintenance of equipment relied upon for LOLA mitigative strategies.

In summary, their approach is maintenance activities for equipment used in mitigation strategies that's also used to support plant operations will be covered by established maintenance and testing requirements for the systems that include this equipment. Additional maintenance activities will be developed to cover equipment that is only used to support LOLA mitigative strategies and not used otherwise to support plant operations. The maintenance activities will include periodic surveillance checks, start-and-run checks and flow tests.

Initially, the applicant’s submittal stated that the operational programmatic aspects of responding to LOLA events would be addressed in facility procedures prior to fuel load. Staff agreed with this implementation schedule but felt that it should be more strongly enforced through a plant-specific license condition because of an importance of showing that procedure and equipment from a -- mitigating a LOLA event were in place and had been inspected by the NRC prior to irradiation of fuel in the reactor.

The staff asked the applicant to propose a draft license condition to be added to part 10 of the Vogtle combined license application for the purposes of establishing an implementation schedule. In response, the applicant proposed license condition establishes a

schedule for completing prior to initial full load full implementation of the operational and programmatic elements of responding to a LOLA event.

Spent-fuel pool cooling was the most significant technical issue that arose during the staff's review. This was a result of the applicant deviating from NRC guidance for addressing spent-fuel pool cooling. The staff needed to evaluate the applicant's proposed alternative strategy to determine if it was acceptable and met the regulatory requirements. Initially, the applicant submittal said that the dispersal of hot fuel, as described in NRC guidance documents, was not necessary for Vogtle because of unique features in the design that relied -- design relied upon to mitigate a LOLA event.

The staff questioned a number of technical aspects of this approach and asked the applicant to consider dispersing the hot fuel as a Defense-in-Depth measure. In response, the applicant proposed an alternative strategy that did not -- excuse me -- did not involve dispersal of hot fuel because of design-related constraints on the pool loading patterns. The applicant enhanced spent-fuel pool spread capability to compensate for the departure from the guidance. The applicant provided an analysis that showed that the alternative strategy could provide adequate cooling for all the fuel stored in the spent-fuel pool.

After several meetings between the applicant and the staff and satisfactory responses to several requests for additional information, the staff found that the proposed spent-fuel pool cooling

strategy met the regulatory requirements of Section 50.54(hh)(2) and was therefore acceptable.

Can I have slide 13, please.

Staff concluded that with the revisions made to the application and the enhanced design features discussed in both, the applicant adequately satisfied the guidance provided in ISG 16 and provided sufficient information, including commitments made in the application, to meet the requirements of Section 52.80(d). This provides a reasonable assurance that the requirements of Section 50.54(hh)(2) will be met prior to initial fuel load at Vogtle.

Thank you for your attention. This concludes my presentation of LOLA, and I will now turn it over to Ravi Joshi.

RAVINDRA JOSHI: Thank you, Mark.

Slide 14, please.

Once again, this is Ravi Joshi. I will be presenting the staff review of Vogtle's COL Chapter 15.

Next slide, please.

This table describes the scope of the staff review of Chapter 15. In the next slide, we will summarize the staff's review of plant calorimetric uncertainty methodology and --

Next slide, please.

The Design Basis Radiological Consequences analyses found in Section 15A.

Next slide.

The AP1000 DCD assumes a 2 percent power uncertainty for the

initial conditions for most transients and accidents. However, the DCD assumes a 1 percent power uncertainty for the initial reactor power for the large break LOCA. Westinghouse introduced a related new COL information item in the AP1000 DCD. The information item states that: following selection of the actual plant operating instrumentation and calculation of the instrumentation uncertainties of the operating plant parameters prior to fuel load, the Combined License holder will calculate primary power calorimetric uncertainty. The calculations will be completed using an NRC acceptable method and confirm that the safety analysis primary power calorimetric uncertainty bounds the calculated value.

The applicant submitted information regarding this item. The applicant stated the plant operating instrumentation for feedwater flow measurement would be the Caldon/Cameron LEFM CheckPlus system, also known as the Caldon system and referenced the NRC staff's SE that approved the Caldon topical report ER-157P.

The NRC staff has previously approved several plant applications of the Caldon system to support a power measurement uncertainty lower than 1 percent. This AP1000 COL information item supports the 1 percent power uncertainty. The staff's review herein focused on ensuring that the generically approved Caldon topical reports are properly implemented for Vogtle. The NRC staff verified compliance with the applicable conditions in the staff's SE for the topical reports. The staff's review also confirmed that appropriate license conditions, and ITAAC, were established for verifying the installation

and ensuring proper administrative controls.

Next slide, please.

Design Basis Radiological Consequences analyses. In this slide I will discuss another issue that remained for the COL applicant to address. The applicant incorporated by reference the Design basis accident, or DBA, dose analyses from the AP1000 DCD, by showing the site-specific input to the analyses is bounded by the assumption in the AP1000 DCD. This information was provided in support of compliance with offsite dose requirements in 10 CFR 52.79(a)(1), and the control room dose criterion in GDC 19. In addition, the applicant provided the technical support center, TSC, habitability analysis which was reviewed by the staff in staff's FSER Section 13.3.

Next slide, please.

The estimated DBA dose calculated for a particular site is affected by the site characteristics through the calculated atmospheric dispersion, which is known as $_{X}$/Q, input to the analysis; therefore, depending on the $_{X}$/Q values, the resulting dose for each site would be different than that calculated generically for the AP1000 design in the DCD. However, all other inputs and assumptions in the COL rad consequences analyses remain the same as in the DCD. Smaller $_{X}$/Q values are associated with greater dilution capability, resulting in lower radiological doses. When comparing a DCD site parameter $_{X}$/Q value and a site characteristic $_{X}$/Q value, the site is acceptable for the design if the site characteristic value is smaller than the site parameter value. Such a comparison would show that the site has better dispersion

characteristics than that required by the reactor design.

For each of the DBAs, the Vogtle site-specific $_{X}$/Q values for each time averaging period, are indeed less than the comparable design reference $_{X}$/Q values, used by Westinghouse in the AP1000 DCD rad consequences analyses.

Since the result of the rad consequences analysis for a DBA during any time period for radioactive material release from the plant is directly proportional to the $_{X}$/Q for that time period, and because the Vogtle site-specific values are less than comparable AP1000 DCD design reference values for all time periods and all accidents, then the Vogtle site-specific estimated total dose for each DBA is, therefore, less than the AP1000 DCD estimated dose.

Because the estimated doses for Vogtle are less than the AP1000's offsite and control room rad consequences, which have already been found to meet the regulatory dose requirements of 10 CFR 52.47(a)(2) and GDC 19, the staff concluded that Vogtle meets the applicable requirements as well. Denise McGovern will cover the Chapter 7.

DENISE MCGOVERN: Hello once again. I will be presenting the staff's review of the Vogtle COL Chapter 7, "Instrumentation and Control," or I&C, specifically the information incorporated by reference from the AP1000 DCD. This information will be resolved in the scope of the AP1000 design certification rulemaking, so we discuss here solely to provide context for the COL review.

Next slide, please.

The AP1000 DCD describes the I&C for the reactor that includes the protection system as well as normal operational controls. I will discuss one of the systems in more detail shortly but first wanted to give a very brief overview of the protection and safety monitoring system, or PMS. There are four divisions within the PMS, each with its own sensors for parameters such as power, pressure, et cetera. A two out of four voting logic actuates the system to initiate protective action. The system uses the common-qualified, or Common Q, platform. The Common Q is a computer system consisting of a set of commercial-grade hardware and previously developed software components. It also contains design-specific application software.

The PMS initiates a reactor trip when the logic detects a condition requiring shutdown. Similarly, it actuates engineered safeguards such as containment isolation, passive core cooling and passive containment cooling when conditions require it. The system also provides the means to monitor the plant's post-accident conditions in the control room. The amendment to the AP1000 design certification included more design detail about the I&C system, which allowed design acceptance criteria, or DAC, to be removed.

Next slide, please.

The PMS is a digital system. In the original AP1000 design certification, the NRC required Westinghouse to provide a diverse actuation system, or DAS, that functions independently of the PMS to initiate protective actions to address common-cause failures of the digital PMS. The DAS is a non safety-related, diverse backup system to

the fully redundant and independent PMS. The DAS system has two modes of operation -- automatic and manual. The automatic actuation is by a two-out-of-two logic. The automatic mode actuates reactor and turbine trips, initiates passive residual heat removal, actuates core makeup tanks and trips the reactor coolant pumps. Which actuations occur depend upon the signal that actuates the system and therefore which functions are needed.

Manual mode is implemented by hardwiring the controls located in the main control room directly to the final loads in a way that completely bypasses the PMS cabinets and the DAS automatic logic.

Next slide, please.

The manual mode can actuate the opening of automatic depressurization valves and initiate in-containment refueling water storage tank injection and containment recirculation. The manual mode can also initiate the actuations found in the automatic mode. The manual mode of DAS is administratively controlled by technical specifications, or tech-specs, with a 30-day completion time. It is included in the tech-specs because of the risk-reduction role that it was credited as part of the focused PRA conducted for the regulatory treatment of non-safety systems or RTNSS.

Availability controls are another aspect of RTNSS. They restrict entry into various operating conditions unless specific -- specified equipment is available. The automatic mode is covered by availability controls with a 14-day time period. With the two-out-of-two logic, if maintenance or testing must be performed on the automatic

DAS, that feature is unavailable.

Next slide, please.

In reviewing the AP1000, the ACRS expressed concerns that there are no explicit provisions prohibiting both the manual mode and the automatic mode from being out of service at the same time. In its response to the ACRS concern, the staff noted that the requirements of 10 CFR50.65(a)(4) to perform risk assessments prior to taking equipment out of service would limit the length of time both the manual mode and the automatic mode could be simultaneously out. In addition, the staff found that the likelihood to be low of a common-cause failure of PMS an event and both DAS manual and automatic functions being unavailable at the same time.

However, in its May 2011 response, the ACRS reiterated its concern, adding that the 30-day completion time was too long. The staff responded to the ACRS and restated its basis for concluding that the current requirements, which date from the initial certification, were acceptable. In particular, the staff noted that the DAS manual control tech-spec completion time was consistent with regulatory practice for a non-safety system that provides backup features for a safety-related protection system.

As I mentioned before, most of the I&C information in the Vogtle FSAR Chapter 7, including the content I just summarized, is incorporated by reference. Therefore, there are no site-specific topics of interest.

And now Ravi will conclude this panel presentation with the

overview of Chapter 8.

RAVINDRA JOSHI: Thank you, Denise. Slide 25, please.

We will be presenting the staff review of the Vogtle Chapter 8, Electric Power, beginning with the Overview of Chapter 8, then site-specific areas of interest. Next slide, please.

This table describes the scope of the staff's review of Chapter 8. In next slides, we will summarize staff's review of each of the topics.

Next slide, please.

Vogtle Unit 3 is connected to the Units 1, 2 and 3, via 230/500 kV kilovolt switchyard at the 230 kV level. Vogtle Unit 4 is connected to an independent 500 kV switchyard. If we go the next slide just for a minute or so, I will describe the switchyard configuration.

This slide shows a simplified diagram of the 3 switchyards onsite. Vogtle Unit 3 is connected to the Units 1, 2 and 3, 230/500 kV switchyard at the 230 kV level. The 230/500 kV switchyard is connected to the remainder of the Southern Balancing Authority Area, or SBAA, transmission grid via 5, 230 kV and one, 500 kV transmission line. There are two 500 kV tie lines connecting the 230/500 kV Units 1, 2 and 3 switchyard with the Unit 500 kV switchyard.

Vogtle Unit 4 is connected to an independent 500 kV switchyard. The Unit 4 500 kV switchyard is connected to the remainder of the SBAA transmission grid via two, 500 kV transmission lines. The reserve auxiliary transformers of Units 3 and 4 are connected to a different 230kV switchyard by two overhead transmission lines.

Now let's go back to the previous Slide 27.

The results of the applicant's grid stability analysis indicated that loss of the largest generating capacity being supplied to the grid, loss of largest load from the grid, and loss of the most critical transmission line will not cause grid instability. This analysis is to satisfy the AP1000 DCD interface requirement that the reactor coolant pump bus voltage will remain above the voltage necessary to maintain the flow assumed in the Chapter 15 analyses for a minimum of 3 seconds following a turbine trip as specified in DCD Section 8.2.

The results of the COL applicant's grid stability studies performed for each available connection to an offsite power supply, demonstrate the adequacy of the offsite power source capacity and capability to power plant components during shutdown, startup, and turbine trip conditions.

The NRC staff has found this information is sufficient to demonstrate that as specified in the DCD, the grid will remain stable to maintain reactor coolant pump operation for three seconds following a turbine trip.

Now that we are finished with the offsite power topic let's go to the next two slides for the next topic. Slide 29:

This slide addresses the topic of monitoring underground or inaccessible cables. In an RAI, the staff asked the applicant to include a inspection, testing and monitoring program, to detect degradation of inaccessible or underground control and power cables, that support equipment and other systems that are within the scope of 10 CFR 50.65,

also known as the maintenance rule.

In response to that RAI, the applicant stated that the Maintenance Rule program will not be implemented until prior to fuel load; as such, specific information necessary to determine appropriate inspections, tests and monitoring is not yet available. However, the applicant also stated that the latest industry experience and other available information, including NUREG CR-7000, will be followed in developing a cable condition monitoring program, as part of the Maintenance Rule program. The applicant also revised its FSAR to include condition monitoring of underground or inaccessible cables in its Maintenance Rule program.

The staff concludes that the applicant's commitment to implement a condition monitoring program for underground or inaccessible cables is acceptable. Next slide, please.

This slide addresses offsite power system ITAAC. 10 CFR 52.79 (d) and 52.80(a) require ITAAC for the site-specific systems. However, the applicant initially did not provide an ITAAC for its offsite power system. In a response to the staff's RAI, the applicant included such an ITAAC which provides that the as-built offsite portion of the power supply, from the transmission network, that interfaces with plant onsite power, will be verified to perform as designed. The staff concluded that the applicant meets the applicable NRC requirements.

Next slide, please.

Our final topic relates to a departure from the DCD. The AP1000 DCD Section 8.3, states, that the Class 1E voltage regulating

transformers are designed to limit the input AC current to an acceptable value under faulted conditions, on the output side. However, the applicant clarified, that the voltage regulating transformers do not have active components to limit current.

The applicant revised its application to include a departure, clarifying the current limiting feature of voltage regulating transformers. The applicant stated that the voltage regulating transformer, in combination with fuses and, or breakers, will interrupt the input or output current under faulted conditions on the output side. The staff reviewed the justification for the departure and found it acceptable because the isolation function provided by use of the breakers/fuses for regulating transformers is consistent with criteria for independence of electrical safety systems. This concludes the Staff's presentation for Panel 3.

CHAIRMAN JACZKO: Well, thank you very much for the very thorough discussion of a number of issues. I wanted to turn to two questions, actually, I have. Both these are for the applicant. And I think the first question -- and maybe it gets back to an issue that Commissioner Ostendorff had raised, I think in early onset in the overview panel but I think is relevant in this section as well. And that gets to the external hazard from flooding. I believe -- I think the comment was made in the beginning that the river flooding level and the maximum river flooding level is 219 feet on the site. Is that --

AMY AUGHTMAN: No.

WESLEY SPARKMAN: The river water is, I think, 178 feet, is

that correct?

AMY AUGHTMAN: Yes.

CHAIRMAN JACZKO: Okay, then what was the -- was there a 200 --

AMY AUGHTMAN: That was the local intense precipitation.

CHAIRMAN JACZKO: Okay, the local intense precipitation on the --

AMY AUGHTMAN: On the site itself.

CHAIRMAN JACZKO: On the site, oh, okay. That was not the river level flooding to -- okay, thank you. That clarifies that. The other question I had for you is also that the -- when it comes to station blackout coping time -- and again, getting back to operating experience. INPO has put out some guidance on operating experience related to station blackout coping times. Is that something that you've incorporated at this point or plan to address in some way, shape or form for units three and four? Do you have a sense of how you intend to handle that?

EDDIE GRANT: You know, that actually would be part of the design for the AP1000. And, of course, they're capable of dealing with loss of offsite power for 72 hours.

CHAIRMAN JACZKO: So I think the INPO recommendation was for 24 or something like that. So your sense would be that they -- you satisfy that --

EDDIE GRANT: We believe they do, yes.

CHAIRMAN JACZKO: Thanks. Let me turn to -- there are a

number of -- and this is for the staff -- there are a number of license conditions -- there were really three of them that stood out to me a little bit -- having to do with the as-built plants and kind of final walk-downs, one of them related to seismic margin analysis; the other one was related to PRA; and the last one was internal fire and internal flood analyses. Could you give me a sense of what the purpose of those specific license conditions were or is -- or are?

RAVINDRA JOSHI: I'll ask Malcolm Patterson.

CHAIRMAN JACZKO: Sure. They seem to be related to the external hazards and the PRA, in Chapter 19 issues. I'm not sure if they're related to things that came out of that review or --

MALCOLM PATTERSON: Yes, sir, indirectly. I'm Malcolm Patterson. I'm a reliability and risk analyst in the Office of New Reactors. I was the lead reviewer for PRA related matters on Vogtle and I had a similar role for the D.C. amendment. The important thing about these walk-downs is, I think, they are walk-downs, we need an as-built plant to be able to perform them and they are to confirm that the assumptions that were made at the time the license is granted remain valid. They are very discipline specific. They require teams of experts with experience in these particular areas who travel about the plant and examine the particular things that we think we know when we license the design. We think we know that these things will be correct but they need to be confirmed because they're very subtle.

CHAIRMAN JACZKO: Given that, how does the staff intend to handle -- and I don't know when these are required -- these are some

time before fuel load, or prior to fuel load. Is there a time period before fuel load that these are to be done?

MALCOLM PATTERSON: It's not specified.

CHAIRMAN JACZKO: So when does the staff anticipate that these will be done then?

MALCOLM PATTERSON: The staff thinks these will be done fairly close to fuel load because so much of the plant needs to be in place to be able to determine that the seismic margin analysis, for example, is maintained.

CHAIRMAN JACZKO: And what if it's not? What's the path forward at that point then?

MALCOLM PATTERSON: The licensee will have to correct the problem.

CHAIRMAN JACZKO: Is there right now a clearly defined way to do that? Or would that essentially -- I mean, does the staff have a clear methodology to determine whether that condition is met or what, kind of -- we'll know it when we see it? Or --

MALCOLM PATTERSON: I think that it will be clear that the conditions are met; it would be a surprise when they aren't but we will be on the alert for it. I know there have been problems in operating reactors. That's the reason we're doing this kind of walk down. So we do know how to identify these things and we do know how to correct them.

CHAIRMAN JACZKO: Ravi, did you want to add anything?

RAVINDRA JOSHI: I just want to add that for each of the individual license conditions they do have implementation milestones

like fuel (unintelligible).

CHAIRMAN JACZKO: Okay.

RAVINDRA JOSHI: Sorry about that.

CHAIRMAN JACZKO: No problem. Thank you. And then last question: The ACRS was in a very different place on the 30 days for the allowed or the limited condition for operation for actuations, I guess, for the manual mode. They were looking at something closer to 72 hours. Can you give me a sense of why there's significant difference? And again, if you could --

RAVINDRA JOSHI: Can we try to get Terry Jackson?

CHAIRMAN JACZKO: Okay.

WHEREUPON,

TERRY JACKSON

was called as a witness for the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

TERRY JACKSON: Yes, my name is Terry Jackson, I'm the chief of the instrumentation and controls branch in the Office of Nuclear Reactors. My staff was responsible for a review of the Vogtle I&C designs as well as the AP1000 I&C design. Yes, we did have several interactions with ACRS on the Tech specs allowed outage time for the DAS manual actions as well as the investment protection controls for automatic DAS functions.

The ACRS concern was that they saw that both the DAS manual and the DAS automatic could potentially be out of service at the same

time so they had concern that if they didn't have that function, then -- and you had a software common cause failure --

CHAIRMAN JACZKO: Just focus specifically on why there is such a big discrepancy. The staff has come through with 30 days; ACRS has come through I think with only 72 hours, which is three days?

TERRY JACKSON: I think the 72 hours is more comparable to a safety related front-line primary protection system from the staff's point of view. And a 30 day is more for a non-safety system to just provide the backup function. So that was from the staff's point of view as we understood it. And that's basically what I can say about it.

CHAIRMAN JACZKO: Okay, thank you. I appreciate it. Commissioner Svinicki

COMMISSIONER SVINICKI: My first question I'll direct to one of the applicant's witnesses and the applicant's Slide 9 mentions the ITAAC related to offsite power interface requirements. The staff also covered this topic and stated that the applicant did not propose this but as a result of a request for additional information, the applicant developed ITAAC related to off-site power interface requirements.

I would like to ask an applicant witness to describe generally what -- generally describe the ITAAC that were ultimately developed and if you could talk about if there's anything relevant in terms of back and forth with the staff and the ITAAC getting into the final form that it was ultimately accepted as.

AMY AUGHTMAN: Okay. This is Amy. I'll briefly describe the ITAAC itself and then Eddie Grant may be able to help with some of the

history of the interactions and how it did get into the application.

Again, there are six design commitments that were established. Most of them have to do, again, with interfacing with the off-site circuits. And, for example, this first one is a minimum of one off-site circuit supplies electric power from the transmission network to the interface with the on-site AC power system.

I guess I could also remind that the AP1000 DCD did receive -- I believe it's characterized as a partial exemption from GDC-17 which would require that you have two sources of off-site power. And what that exemption did for the DCD was to allow for one off-site source. And so that's one of the design elements as well is that there be a confirmation for at least one off-site source. And then, as was also touched on, there is a design commitment for the reactor coolant pumps to continue to receive power from either the main generator or the grid for a minimum of three seconds following a turbine trip.

In terms of interactions with the staff, there was a series of RAIs and phone calls and in the end we listened to the staff's concerns and agreed to include the ITAAC. I don't know if Eddie has more to add.

EDDIE GRANT: I would ask if that's sufficient and if it's not, I can elaborate.

COMMISSIONER SVINICKI: No, no, that's fine. Thank you. That's helpful.

This question is directed to the staff, I think, to Mark, probably. You discussed the fact that there are strategies to address

loss of large areas which require a demonstration. My question revolves around really how the commitment is memorialized or tracked in terms of the COL. There was reference to plant specific license conditions and that may be the answer to the question. But I'm interested in maybe a bit more into the mechanics of how and when and just the mechanics of these demonstrations and anything at a high level you can describe there.

MARK CARUSO: Yes. Mark Caruso of the staff. The commitments that the applicants made will be tracked by them and using the same commitment tracking system, management system that was discussed before. Now when you said demonstration, were you talking about like the walk-down simulation?

COMMISSIONER SVINICKI: Yes. I think that equipment walk-throughs or walk-downs was something -- you used I think a few different terms to refer to them -- but basically you talked about strategies to address loss of large area and there was some use of the term demonstrations. I don't know if that's just you're going to observe an evolution by the applicant or how you're going to go about that and what the time frame for doing that would be.

MARK CARUSO: Well they had made commitments in a number of areas to actually walk through the strategy, walk through the procedure after the development to make sure that they can implement it. And especially if there's -- if it's time sensitive it's very important to go through it, make sure you can see it, you can connect this to that and do these things. In some cases, they said, well, if doing that

would involve creating a hazardous condition and are actually violating requirements like blocking open fire doors, that they would do a simulated version of it which is, well, maybe they would go to the building and go as far as they can go and then say, okay, now we'll go up these stairs and do this and can I do that in a certain amount of time.

So those are commitments and to do those things we will -- when we do an inspection we will examine what they've done and what they've found in those activities. The only other thing I might mention is that we did impose a license condition for them to maintain their program so that, as time goes on, these things are continued. That the things it takes to make sure the program is always up to snuff and they can implement the strategies effectively. Needs to continue and this provides us some additional, if you will, ability to enforce that.

COMMISSIONER SVINICKI: Okay. Thank you, that's helpful. And just to be sure I understood, on staff Slide 27 there is reference in the second bullet to Unit Four connected to a different 500 kV switchyard. Is that a switchyard yet to be constructed or does that exist now? I wasn't sure, by the way this was written here -- I'm talking about the second bullet on staff Slide 27.

RAVINDRA JOSHI: Can we ask Tania to expand on that one?

COMMISSIONER SVINICKI: Okay.

WHEREUPON,

TANIA MARTINEZ-NAVEDO

was called as a witness for the Nuclear Regulatory Commission and,

having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

TANIA MARTINEZ-NAVEDO: My name is Tania Martinez-Navedo. I'm an electrical engineer in the Office of New Reactors. I'm already sworn in. The 500 KV switchyard to which our Unit 4 is connected to it would be a new switchyard.

COMMISSIONER SVINICKI: Okay, thank you, Tania. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Apostolakis.

COMMISSIONER APOSTOLAKIS: Thank you, Mr. Chairman. I'm trying to understand how the seismic margin analysis was done. The applicant mentioned that the review level earthquake was .44G. And I understand the DCD has .5G as a review level earthquake. Is that true?

MALCOLM PATTERSON: Malcolm Patterson again. The seismic margin analysis is performed with a 0.5G earthquake.

COMMISSIONER APOSTOLAKIS: That's -- but the applicant says .44 for the site.

MALCOLM PATTERSON: .44 is used as the GMRS and they have to show margin of 1.67 times the GMRS as a minimum basis for concluding that the AP1000 seismic margins still apply is that the inside -- sorry - in-structure response spectra for the GMRS of 0.44 produces actually a lower excitation than the CSDRS.

COMMISSIONER APOSTOLAKIS: 1.67. or .44?

MALCOLM PATTERSON: That's correct.

COMMISSIONER APOSTOLAKIS: So what is the SSE?

MALCOLM PATTERSON: The SSE for Vogtle is the GMRS.

COMMISSIONER APOSTOLAKIS: .44. Is that too high for the eastern United States? Go ahead.

BRET TEGELER: Maybe I can add just a point -- Bret Tegeler again, structural engineering. I assisted with the seismic margin evaluation. The .44 does incorporate the 1.67 so the --

COMMISSIONER APOSTOLAKIS: So the SSE is .26?

BRET TEGELER: Right. And so -- and that's the reason that the IBR, that the margin for the DC, if you will, is covering the Vogtle site.

COMMISSIONER APOSTOLAKIS: But you did check the fragilities for the components that were in the frequency --

BRET TEGELER: Absolutely, absolutely. It was all done through the SSI process.

COMMISSIONER APOSTOLAKIS: So the applicant did not do an SMA, is that correct?

BRET TEGELER: They did, they did.

COMMISSIONER APOSTOLAKIS: The DCD, is that correct?

BRET TEGELER: The applicant looked at the incorporated by reference the plant specific elements. The site specific elements such as the assessment of liquefaction and bearing capacity overturning and sliding stability, they was assessed separately. And they computed factors of safety based on comparison to the review of our earthquake and the demand of the site.

COMMISSIONER APOSTOLAKIS: And also my understanding is that

the SSE with .26g was not determined using the probabilistic seismic hazard analysis. Is that correct? Is that what you said earlier?

BRET TEGELER: The 0.26 is coming -- that is the GMRS that is coming from the PSHA.

COMMISSIONER APOSTOLAKIS: Oh, it does?

BRET TEGELER: It does. For the standard design that is a deterministic analysis and that is not reflective of the PSHA but the, again, the Vogtle GMRS --

COMMISSIONER APOSTOLAKIS: It is site specific.

BRET TEGELER: Yes.

COMMISSIONER APOSTOLAKIS: And it's a result of the PSHA?

BRET TEGELER: Yes.

COMMISSIONER APOSTOLAKIS: Thank you. I don't know if this is appropriate for here. I went back to the FSAR and started reading the SMA description and I can't quite follow it, the cyclical statements. For example, it says for site specific conditions the review level earthquake is 1.67 times VEGP GMRS, where the VEGP site specific review level earthquake is 1.67 VEGP GMRS. I don't understand that. I mean, somebody was cutting and pasting from the word processor because this doesn't make sense. Now I don't know if that's relevant to this review, but I couldn't let it go.

BRET TEGELER: Do you want an answer, or do you -- ?

COMMISSIONER APOSTOLAKIS: Well, do you have access to the FSAR right now? You don't. So if you want to go back to it, it's section 19.55.6.3. The paragraph starts, "For site specific

conditions." Somewhere in the middle there.

Now on Slide -- well, maybe I have some questions for Lynn so she can't be quiet. How is the PRA used in the review? Was it used at all?

WHEREUPON,

LYNN MROWCA

was called as a witness for the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

LYNN MROWCA: Well, the PRA is really part of the DC application and the amendment and what the plant does, what Vogtle would do, is adopt the design certification PRA as their plant specific PRA at the time of application. And, since the DC covered the bounding values for the external hazards then the applicant had to show that they were within those bounding values.

COMMISSIONER APOSTOLAKIS: But it doesn't look like the PRA affected the results of the other reviews, did it?

LYNN MROWCA: Can you give me an example?

COMMISSIONER APOSTOLAKIS: Everything that was presented earlier with no reference to anything that came from the PRA.

LYNN MROWCA: You mean, external hazards, or --

COMMISSIONER APOSTOLAKIS: Yes, was it used there at all?

LYNN MROWCA: The PRA, when design changes were made, we did look for impacts --

COMMISSIONER APOSTOLAKIS: So you were looking only in case

something extraordinary happened but as long as it was below some limit --

LYNN MROWCA: For external hazards, yes.

COMMISSIONER APOSTOLAKIS: -- it was okay. And there will be a site specific PRA before fuel loading?

LYNN MROWCA: Yes, at fuel load, requirement 50.71(h)(1).

COMMISSIONER APOSTOLAKIS: Would that -- would the results of that be able to be submitted to the NRC?

LYNN MROWCA: Not submitted to the NRC. Currently we don't have an inspection procedure. We do have the regulation that they have that site specific PRA. I think a lot of the staff would think it's a prudent thing to do. I think as regulators we can inspect what we need to but we don't have an inspection procedure in place. And, if the applicant, for instance, decides to implement some risk informed initiatives by license amendment then we would want to make sure that the PRA is technically adequate for those applications.

COMMISSIONER APOSTOLAKIS: So we will only look at it if they come back and say we want to implement 50-69 or whatever.

LYNN MROWCA: But for instance, one example might be maintenance rule, we will do a maintenance rule inspection prior to fuel load and typically people use the PRA to support A-4 of the maintenance rule. So as part of that we have, in the past, operating plants performed an inspection of the PRA to some level.

COMMISSIONER APOSTOLAKIS: Thank you very much. I appreciate it.

LYNN MROWCA: You're welcome

CHAIRMAN JACZKO: Mr. Magwood.

COMMISSIONER MAGWOOD: Thank you, Mr. Chairman. Let's start with a couple of questions for the applicant: The -- we've talked a lot about the 50.54(hh) equipment that you'll require for units three and four. I haven't heard anything yet about how that program might be integrated, if at all, with the program from Units 1 and 2. Is there any exchange between those two?

WESLEY SPARKMAN: In my presentation I did talk about the fact that for Phase 1 information -- excuse me -- we did take into credit for a number of things that have been done on unit one and two. However, for Phase 2 and Phase 3 they're written more specific to the AP1000 design. And so things that would be applicable to one and two are not necessarily applicable to three and four.

COMMISSIONER MAGWOOD: So does that mean that there might be some common equipment shared between the four units?

WESLEY SPARKMAN: More on the lines of procedures and strategies and MOUs with outside agencies. I don't know if there would be shared equipment. Like for instance, a portable pump, we'd probably have different portable pumps for the units as opposed to one that would serve all four.

COMMISSIONER MAGWOOD: Okay, so really you'll be operating as two separate sites, to some degree.

WESLEY SPARKMAN: To some degree.

COMMISSIONER MAGWOOD: The -- what is your expectation for

how you'll maintain the proficiency of the use of the equipment going forward? For these two new units, have you laid out a plan of doing drills or anything of that nature?

WESLEY SPARKMAN: Those procedures have yet to be developed. However, similar to what's being done in unit one and unit two, for systems and components that are utilized in normal operation we would take advantage of the normal maintenance that's done on those systems but for things that -- such as hoses or a portable pump or something like that that would not be normally used in the normal course of operation we would have an inspection and/or testing program that would cover those things to insure that they are available. And then, also, again walking through what it would take to actually implement those particular strategies on a periodic basis.

COMMISSIONER MAGWOOD: Let me switch to the staff with that, then just ask, what consideration does the staff give to assuring the long term viability of their strategies and methodologies to respond to a LOLA incident?

MARK CARUSO: I think for Vogtle 3 and 4, one point I would make is that for the -- for the core cooling and containment cooling strategies especially, as the applicant described, they relied primarily on unit specific safety related equipment which will get treatment of the maintenance rule and safety rule, the equipment does. For fuel pool the design features are not -- they're not safety related and that would come under their additional maintenance program.

For fire protection, the strategies are described and they

have made commitments. But as far as maintaining all the strategies as time goes on, as I mentioned, we felt that our initial inspection would be to have implemented these strategies appropriately to ensure their effectiveness. But going forward to insure that stays the case, we've established an additional license condition that specifically requires it to maintain the program and we'll inspect against that as we need to.

COMMISSIONER MAGWOOD: Okay. A specific question for you: What -- the applicant highlighted the fact that they have hard pipes which, I assume, are in lieu of running hoses to the spent fuel pools. Why are hard pipes better than running hoses to the spent fuel pools? Because if you think about the sorts of instances that could happen, particularly post Fukushima, you've got significant damage to the building and I wonder if the hard pipes are actually a more robust approach at the end of the day than simply having hoses that you can take to wherever they need to go.

MARK CARUSO: Well, I think in general the feeling is if you -- if you have damage inside the building or perhaps a large fire inside the building, access to the deck could be limited. In their particular case, what they've done and in fact this was something that the industry came up with and incorporated in the guidance was to have connections on the outside of the building on both sides of the building. So if you had your large area on one side you still have the other side with quick connect flanges so you can just -- it really reduces the dependence on human action. You basically roll up to this thing and connect up your pump and turn it on and you've got water.

Now, if you have an event that involves severe damage to the building, you still have the ability to use fire hoses. They still have fire hoses. They have fire hoses on the deck but I think -- in general I think the feeling is that especially with one on each side of the building that this is a better way to go than having to have a lot of people involved and get inside the building and worry about access.

COMMISSIONER MAGWOOD: Fair enough. Just one quick question, I think, for Denise. The -- you went through the discussion on external hazards, external threats. Was -- did any of the analyses include the combination of many of those or were they all looked at as individual events?

DENISE MCGOVERN: And as a project manager I'm not a technical expert on any of the so I will call on my "phone a friend".

MALCOLM PATTERSON: Malcolm Patterson again. For each one of those events, the individual class of event was looked at separately but, for example, in trying to determine the maximum flooding, many different events likely to occur together were considered at the same time. We were looking for the one times 10 to the minus six flooding event. So you'll have in the evaluation of the flooding associated with a hurricane, you'll have not only the precipitation but also the run up. With high winds you might have a seiche at some other plant. But yes, we do combine things in order to establish a low enough probability.

COMMISSIONER MAGWOOD: Thank you very much. Thank you, Chairman.

CHAIRMAN JACZKO: Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman. My questions to the staff -- I'll let you figure out who wants to answer these. Let's start with digital I and C. And earlier this year the Commission -- well maybe it was late 2010, the Commission had a meeting with ACRS and other meetings with staff dealing with basically design acceptance criteria, DAC. Are there any elements of the DAC for a Vogtle digital I and C that are specific to Vogtle or are they are being handled as part the AP1000 design certification?

RAVINDRA JOSHI: Do you want to answer the question?

TERRY JACKSON: Terry Jackson again. And the design acceptance criteria all reside with the AP1000. At DCD, there is not site specific, design specific criteria for Vogtle. Within the AP1000 design, when they came in for the amendment, they proposed to provide design information to address and basically remove the design acceptance criteria from the certified design. They were successful in being able to remove one but there is still one that remains in the AP1000 design.

COMMISSIONER OSTENDORFF: Thank you. I'm going to shift over to electric power, the station blackout discussion, specifically batteries. And can you talk briefly about what protection exists for the batteries at Vogtle 3 and 4 against external event hazards? Could somebody address that?

RAVINDRA JOSHI: Let me ask Tania to address the question.

OM CHOPRA: Om Chopra, electrical systems branch, Senior Electrical Engineer. The batteries are qualified for GDC-2, GDC-4, so they are protected from seismic as well as flooding.

COMMISSIONER OSTENDORFF: Were there any specific aspects of the battery with respect to the siting of the Vogtle site location that warranted special attention by the staff in this review of the license?

OM CHOPRA: I don't think anything would be different because it's AP1000 design.

COMMISSIONER OSTENDORFF: Strictly referencing back to the AP1000 design certification.

OM CHOPRA: Yes.

COMMISSIONER OSTENDORFF: Thank you. Last question gets into the accident analysis. On slide 16 of the staff slides, there are several sections that reference plant specific information as opposed to basically being incorporated by reference. Can you -- I'm trying to understand, for instance, the decreased reactor coolant inventory. Let's just take that one as an example. Why is that particular item not bounded entirely by the AP1000 design cert? There's a couple -- this will be the context for the question.

RAVINDRA JOSHI: I can't recall specifically on that one but I can get back to you --

COMMISSIONER OSTENDORFF: Okay.

RAVINDRA JOSHI: -- specific on that one. At this point I don't have a reference on that one so --

COMMISSIONER OSTENDORFF: It just didn't strike me -- the reason my question is that that's one that did not strike me as being a site specific or licensee specific accident analysis and that's kind of what struck me.

RAVINDRA JOSHI: Okay.

COMMISSIONER OSTENDORFF: Thank you. Thanks you, Mr. Chairman.

COMMISSIONER APOSTOLAKIS: I was not too enlightened by the answer to Commissioner Magwood's question about combination of events. The way I understand it is this: If you do a seismic margin analysis you're looking at the structure or the response of the plant. The fact that you may have an internal flood because you may have a dam failed, or you may have a fire that would follow its own course is not investigated, is that correct? You're nodding, Lynn.

LYNN MROWCA: Yes. I would say that in some of the issues, for instance, like Malcolm talked about flooding, he might add water levels to get a higher flooding level but do we look at flooding and seismic together? No.

COMMISSIONER APOSTOLAKIS: So the answer to the question was no.

LYNN MROWCA: Well, I think that --

COMMISSIONER APOSTOLAKIS: We are not looking at secondary, so to speak, an external event that is caused by the earthquake. Nobody ever does. Why should you do it?

MALCOLM PATTERSON: I'd like to point out that the seismic margin analysis is not like a seismic PRA.

COMMISSIONER APOSTOLAKIS: I know it isn't.

MALCOLM PATTERSON: And all we're doing is demonstrating that the structure system and components are sufficiently robust to give us

margin. We can do the safe shutdown. We aren't looking at the consequences of exceeding seismic margin.

COMMISSIONER APOSTOLAKIS: So the answer to you, Commissioner Magwood, is no. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Any other questions? Do you have a question?

COMMISSIONER MAGWOOD: Just a comment, maybe a question before we run away. You know, I think Commissioner Apostolakis is correct about that but it's -- the way I understood your response earlier was that I don't think you claimed to have covered all the combinations but there were some logical combinations that you did look at. For example I think the example you mentioned was the Katrina scenario where you have a storm surge plus flood plus wind that would be one of the combinations you looked at. Is that right?

MALCOLM PATTERSON: That's exactly right.

COMMISSIONER MAGWOOD: But they didn't look at the spectrum. For example, as you pointed out, flood plus earthquake or some other combination. All those weren't looked at.

MALCOLM PATTERSON: I would say, in doing the internal flooding analysis, what we do is we look at tanks in the plant and if those tanks failed, where will the water go? And what will the consequences be? So we sort of do a piecewise consequence analysis.

COMMISSIONER MAGWOOD: For example, as a result of an earthquake, is that --

MALCOLM PATTERSON: We wouldn't -- we would assume a tank

failure. We would not make it conditional on an earthquake.

COMMISSIONER MAGWOOD: Thank you.

CHAIRMAN JACZKO: Since we're late in the day, I'll confuse matters even more. So as I understand it, you don't look at the initiating event and the fullest range of impacts of the initiating event. You look at consequences and you look at ways to get maximum consequences. But for instance, you don't take -- if your maximum flood occurred because you had a hurricane followed by dam failure somewhere, which was -- and the dam failure was the result of a seismic event, that would give the maximum flood level. But you wouldn't look at the plant to see what is the impact on the plant of a simultaneous earthquake and seismic earthquake and hurricane simultaneously and generically look at the impact on a plant?

MALCOLM PATTERSON: We would not combine a seismic event with a hurricane. We would look at dam failures caused by hurricanes. We might consider those together. We would look at the consequences of dam failure --

CHAIRMAN JACZKO: And then there would be consequences so there would be the elevated water levels that are impacting the plant but not then simultaneously the impact of the hurricane as well on the plant for high wind speeds or other types of effects. Okay, thanks. Anything -- any other questions?

Well, I want to thank everybody and in particular my colleagues on this side of the table. It's been a long but very productive day and we will adjourn for the evening. We'll be back

tomorrow morning at 9:00 and finish up with the safety panel and then the environmental discussion and we appreciate the applicant being here as well. Thank you.

(Whereupon, at 5:16 p.m., the above-entitled matter recessed to reconvene at 9:00 a.m., September 28, 2011)

E-N-D-P-R-O-F-P-R-O-C-D-E-E-D-I-N-G-S

United States of America

Nuclear Regulatory Commission

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HEARING

IN THE MATTER OF DOCKET NO: 52-025-COL and

SOUTHERN NUCLEAR OPERATING COMPANY 52-026-COL

VOGTLE ELECTRIC GENERATING PLANT,

UNITS 3 AND 4

Wednesday,

September 28, 2011

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Rockville, Maryland

The hearing commenced in the Commissioners' conference room, 11555 Rockville Pike, Rockville, Maryland, at 9:00 a.m.

BEFORE:

Gregory B. Jaczko, Chairman

Kristine L. Svinicki, Commissioner

George Apostolakis, Commissioner

William D. Magwood, IV, Commissioner

William C. Ostendorff, Commissioner

APPEARANCES:

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P-R-O-C-E-E-D-I-N-G-S

9:00 a.m.

CHAIRMAN JACZKO: Well, good morning. Now, we'll reconvene the second day of the mandatory hearing on the Southern Nuclear Operating Company's application for two combined licenses for the nuclear reactors and for a limited work authorization at the Vogtle site near Waynesboro, Georgia and at the onset I want to remind all the witnesses that they are under oath and again, if witnesses are not at the table -- witnesses who are not at the table, do come and speak either at the microphone or the podium, I'll remind them to state their name and if they are not -- or whether they've been sworn in. And most importantly they have not been sworn in, that we make sure that they're sworn in.

We'll begin this morning with the fourth and final safety panel and we'll focus on Chapters 9, 12, 13, and 14 of the FSER and the relevant sections of the application. Among the important issues analyzed in these chapters include emergency planning, spent fuel design, radiation, protection for workers, and initial test programs. And I should also note that the staff has informed the Commission that they do not have a specific topics to discuss in Chapters 4, 10, and 11, and if the Commission has questions on those chapters, this would be the most appropriate time to raise them. So, we'll begin with the staff, if you could again just state your name and title for the record.

WHEREUPON,

MICHAEL SHINN

ERIC LEE

DENISE MCGOVERN

were called as witnesses for the Nuclear Regulatory Committee and, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:

DENISE MCGOVERN: Denise McGovern, Project Manager, NRO.

ERIC LEE: Eric Lee, Senior Security Specialist with the Office of the Nuclear Security and Incident Response.

MICHAEL SHINN: Mike Shinn, contractor supporting the Office of Nuclear Security and Instant Response.

CHAIRMAN JACZKO: So, we'll allow the applicant to take their name and then begin their presentations.

WHEREUPON,

THEODORE AMUNDSON

EDDIE GRANT

WESLEY SPARKMAN

JERRY SIMS

were called as witnesses for Southern Nuclear Operating Company and, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:

THEODORE AMUNDSON: Ted Amundson, EP Consultant.

JERRY SIMS: Jerry Sims, security consultant for Southern Nuclear.

WESLEY SPARKMAN: Wes Sparkman COL licensing supervisor, Vogtle 3 and 4.

EDDIE GRANT: Eddie Grant, AP1000 Support Licensing Lead.

CHAIRMAN JACZKO: Okay. Great. Well I will I guess turn it to you Mr. Sparkman to begin.

WESLEY SPARKMAN: Thank you very much. Can we go to slide two please? Today is safety panel four. We will be covering items from Chapters 9, 12, 13, and 14. Ted Amundson will begin by covering emergency planning and the technical support center. Next, Jerry Sims will discuss the cyber security plan. I will then cover spent fuel pool redesign, raw water system, information related to ALARA and minimization of contamination, and finally Eddie Grant will cover the first plant only and the first-three-plant only testing. Next slide, please. And now, I'll turn it over to Ted.

THEODORE AMUNDSON: Thank you, Wes. A complete and integrated emergency plan was approved in the early site permit. Seven permit conditions were associated with the emergency plan. Six of the permit conditions, three for each unit, were associated with emergency action levels. The bases and disposition of the permit conditions related to EALs is discussed in more detail on the next slide.

One permit condition was related to the approval of the technical support center location. The location of the TSC is a departure from the location of the TSC as specified in the AP1000 for DCD. Although the design and location of the TSC was found to be acceptable by the staff, because the ESP application was based on Revision 15 of the AP1000 DCD and because Revision 15 of the DCD did not include the same material regarding the location of the TSC, as did Revision 19 of the AP1000 DCD, the staff deferred regulatory action on the location of the TSC to the combined licensed application phase. The departure was approved by the staff in the COL final safety evaluation report. Next slide, please.

Because certain design details are not complete, some emergency

action level set points have not yet been established. Consequently a proposed combined license condition contains a requirement that a complete set of EALs be submitted to the NRC for review at least 180 days before fuel load. The EALs will be in accordance with Revision 0 of the Nuclear Energy Institute 07-01, which is titled Methodology for Development of Emergency Action Levels Advanced Passive Light Water Reactors. In addition, the EALs will contain no deviations and the EALs will have been discussed and agreed upon with state and local officials. Next slide, please.

Because Revision 15 of the AP1000 DCD did not include the same material regarding the location of the TSC as did Revision 19 of the AP1000 DCD, the staff deferred regulatory action on the location of the TSC to the COL application phase. The location of the TSC was addressed in Departure 18.8-1. As part of the departure review and as follow-on to an ASLB question, both radiological and non-radiological habitability questions were addressed in the COL phase. As a result an ITAAC was added to verify that the habitability issues will be addressed by the design to TSC. Next slide, please.

The TSC will be designed to handle an accident that affects one or all four units at Vogtle and will be designed to accommodate the emergency plan provisions for all four units to be located at the Vogtle site. In response to an ACRS open item which raised a question related to human factors engineering for a multi-unit TSC, we modified the emergency plan to include provisions for specific positions dedicated to both Units 1 and 2, and Units 3 and 4. The positions are operation support supervisor and engineering supervisor. In other words, we will have a dedicated operation support supervisor position for Units 1 and 2, and another dedicated operation support supervisor for Units 3

and 4.

Similarly, we will have two dedicated positions for the engineering supervisor position. To better verify the human factor design elements within the TSC, we added a graded exercise related ITAAC to ensure equipment and data display is clearly identified and reflect the affected unit. Next slide, please, and Mr. Jerry Sims will discuss cyber security.

JERRY SIMS: Thanks Ted. Good morning. In June of 2010, Southern Nuclear Company submitted a cyber security plan in accordance with the requirements of 10 CFR 73.54 echo, brand new rule. Vogtle was one of the first applicants to develop a plan using the plan template that was provided in Reg. Guide 5.71, as appendix alpha.

Cyber security program will be developed using this plan that was submitted. Vogtle's Cyber Security Plan, CSP, is a standard AP1000 cyber plan. It was developed with the assistance of a team that included cyber security subject matter experts from each of the current AP1000 applicants. In general, Vogtle's CSP adopts all of the key elements and objectives of Reg. Guide 5.71. However, the AP1000 cyber security team looked very critically at what was in 5.71, including the plan template which was appendix alpha and in so doing, the team identified a number of deviations. Each deviation was discussed and evaluated in the CSP, including a justification for SNC's determination that the deviation meets the objectives of the cyber security rule and the objectives of Reg. Guide 5.71 or alternatively it does not reduce protection from a cyber security attack.

Following the guidance in SECY 05 0197, SNC proposed implementing the CSP as an operational program. A proposed license condition will require

periodic updates to the cyber security program implementation schedule to facilitate any pre-implementation inspections that need to be performed. The program implementation schedule is consistent with other security programs as per 7355-Alpha4. I'll now turn it over to Wes. Next slide, please. And Wesley Sparkman will address three other topics.

WESLEY SPARKMAN: Thank you, Jerry. I will now address some of the -- several actual special topics requested by this panel and the first being spent fuel pool redesign. The DCD addresses spent fuel pool design and evaluations in sub-section 9.1.2 spent fuel storage. The DCD section provides design descriptions, including the recent redesign and corresponding revisions in the criticality and seismic evaluations. This DCD information is incorporated by reference into the COLA at FSAR section 9.1.

There are some site specific additions to that NRSR. The site specific COL information item 3.7-2 addresses procedures for verification, of spent fuel pool, rack to wall gap dimensions following a seismic event. In addition, we have some supplemental information, supplemental information item 9.1-3, which addresses safe load paths for heavy loads near the spent fuel pool and a standard COL information item 9.1-7, which addresses Metamic coupon monitoring to check for swelling and boron depletion. Next slide, please.

The next special topic requested for this panel is the raw water system. The raw water system is a site specific system which is addressed in COLA FSAR, Section 9.2-11. The raw water system performs no safety related functions. And failure of the raw water system or its components does not affect the ability of safety related systems to perform their intended function.

Sources of water for the raw water system include river water and well water. The system provides waste -- excuse me, provides water for numerous uses, examples of which are included in the following three bullets. I will discuss these functions within the context of the sub-system that supplies them. The raw water system river water sub-system provides river water for makeup to the circulating water system, natural draft cooling tower basins and fill water for the circulating water system. The river water sub-system also provides dilution water for the Units 3 and 4 blow down sump, for rad waste discharge when the circulating water system is not available.

The second sub-system of the raw water system is the well water system, which provides make-up for the service water system, mechanical draft cooling tower basins, the potable water system, fire protection system, yard fire water systems, and de-mineralized water treatment system. In addition, the well water sub-system also provides lubrication cooling water to the circulating water system pumps and well water for miscellaneous plant uses. Next slide, please.

The last special topic that I'll discuss is ALARA and minimization of contamination. COLA incorporates DCD Section 12.4 by reference and supplements DCD Section 12.4 to address radiation exposure to construction workers. The construction worker doses were conservatively estimated as shown in COLA FSAR Table 12.4-201, which identifies the estimated maximum annual dose for each pathway as well as the total dose. The concept of ALARA as codified in 10 CFR 20.1101Bravo, which states, the licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principals to achieve occupational dose and dose to members of the

public that are as low as reasonably achievable. The ALARA program is part of the Radiation Protection Program. The ALARA principals are included in DCD Section 12.1 and 12.3 for programmatic and design considerations. The ALARA program applicable to Units 3 -- excuse me, 3 and 4 during construction is the VEGP Units 1 and 2 ALARA program until such time as Unit 3 is completed, at which time the ALARA program for Unit 3 will then cover Unit 4.

The COLA also incorporates DCD Section 12.5 by reference and supplements DCD Section 12.5 with appendix 12 Alpha Alpha radiation protection program description. This appendix adopts NEI 08-08 Alpha for a description of the operational and programmatic elements, and controls that minimize contamination. 10 CFR 20.1406, minimization of contamination, is applicable to Part 52 applicants submitted after August 20th, 1997. The DCD includes considerations for minimization of contamination of the facility and the environment. The COLA will implement procedures for operation that will minimize contamination of the facility and environment, facilitate eventual decommissioning and minimize generation of radioactive waste. The mechanism for accomplishing this is NEI 08-08 Alpha, which was reviewed by and endorsed by the NRC staff as an acceptable method of meeting the applicable requirements of 10 CFR 20.1406. The NEI guidance is based on Reg. Guide 4.21 and takes advantage of the established industry guidance of NEI 07-07 for ground water monitoring. Next slide, please. I will now turn the presentation over to Eddie Grant to discuss first plant testing and first three plant testing.

EDDIE GRANT: Thank you, Wes. Chapter 14 addresses the initial test programs, including some tests designated as to be accomplished or required to be accomplished by the first plant only or the first 3 plant only.

This initial or start-up testing program includes pre-operational testing, initial criticality and low power testing, and the power extension testing. The majority of the initial test program is discussed in the DCD, Chapter 14 and of course incorporated by reference into the COLA and FSAR Chapter 14.

The COLA also supplements the DCD with a commitment to develop a start-up administrative manual that will provide the applicants administrative controls over the initial test program and the COLA also provides a description of the applicant's start-up organization, including staffing and responsibilities. These two items comprise the majority of the COLA FSAR material related to Chapter 14. The COLA also includes a few test descriptions included for some of the site-specific systems, and monitoring outside the scope of the DCD.

A few of these initial tests, as I indicated, are required to be performed on only the first plant or the first three plants. A few of these are listed on the slides. Slide 11, for instance, shows preoperational testing, first plant only tests. There are three of those. Next slide, please.

Slide 12 indicates a couple of preoperational tests that are first three plant only tests, heated recirc tests and assisted ADS blow down test. Next slide, please.

This slide shows two first plant only initial criticality and low power tests, and the final slide, Slide 14, sorry, shows two first plant only power ascension tests. These DCD described tests are incorporated by reference into the COLA, FSAR Chapter 14 and are also specified as proposed license conditions in the proposed license attached to the staff's SECY attachment.

These tests will be completed and the results made available to the NRC upon completion of the license conditions, and this completes the applicant's presentations for panel four.

CHAIRMAN JACZKO: Let's have the staff come forward and begin.

DENISE MCGOVERN: Good morning. In this panel we will be presenting SER Chapter 13, highlighting emergency planning and cyber security; Chapter 9, auxiliary systems; Chapter 12, radiation protection, and then Chapter 14, initial test program.

I will be presenting emergency planning and then joining me at the table are Eric Lee and Michael Shinn, who will discuss the cyber security review. Eric is a senior security specialist in the Office of Nuclear Security and Incident Response. Michael is a subject matter expert in the field of cyber security. Following their presentation, I will finish up and address SER Chapters 9, 12, and 14. Slide three, please.

I will begin with a summary of the staff's evaluation of FSAR Chapter 13, conduct of operations and provide an overview of the application, the information that is IBR from the standard AP1000 and the staff's -- and provide an overview of the staff's earlier review of the emergency plans submitted as part of the early site permit or ESP application. Certain issues that were resolved in the ESP proceeding are also discussed here to provide context for the COL review. Next slide, please.

This table provides an overview of FSAR Chapter 13 and identifies whether the information in each FSAR section is IBR, standard, site, specific, or supplemental information. For example, Section 13.3, emergency planning includes information that is standard from the AP1000 design as well as

information that is site specific. Next slide, please.

Section 13.3 of the COL application addresses emergency planning associated with the proposed Vogtle Units 3 and 4. The overall emergency plan sometimes referred to as a complete and integrated emergency plan consists of both the applicant's onsite emergency plan and the state, and local, which is the offsite emergency plans. The COL application incorporates by reference the ESP and the AP1000 standard design. As part of its ESP application, Vogtle included a complete and integrated plan for the Vogtle site consisting of the applicant's onsite plan, including an evacuation time estimate or ETE, and a state and local offsite plans.

As documented in the ESP review, the staff concluded in coordination with the Federal Emergency Management Agency referred to as FEMA, that the overall state of onsite and offsite emergency preparedness, when fully implemented, will meet the relevant regulatory requirements to support full power operations of the plant.

As part of the ESP application review, FEMA evaluated the offsite emergency plans for Georgia and South Carolina, and the affected counties. FEMA provided its detailed findings to the NRC in 2007. For the COL application, FEMA provided its findings in 2008, which stated that the finding and determinations made for the ESP application remain unchanged for the Vogtle COL application.

A summary of FEMA's conclusions from its ESP application review, which are applicable to the COL application, are provided in the final safety evaluation report. Because of the finality given to referenced NRC approvals under NRC regulation, the staff's review of the COL application was limited by

the scope and nature of matters resolved in the previous ESP application review and the AP1000 design certification rule. Therefore, the staff's emergency planning review of the COL application focused on the resolution of ESP permit conditions, a variance from the ESP, AP1000 COL action items, a departure from the AP1000 design and associated supplemental information. Next slide, please.

Are we on five? Slide five, please. Nope. Okay. I must be mis-numbered.

CHAIRMAN JACZKO: I think you're already on five. You're --

DENISE MCGOVERN: Yep. All right, EALS. For Vogtle ESP --

CHAIRMAN JACZKO: Slide 6.

DENISE MCGOVERN: Yes. Thank you. The Vogtle ESP includes nine permit conditions, seven of which are related to the emergency planning. The staff's review confirmed that the COL applicant met all of the seven ESP permit conditions for emergency planning. Permit conditions 2 through 7 address the completion of a fully developed emergency action level, or EAL scheme for both Units 3 and 4. Permit conditions 2 and 3 require the EAL schemes to reflect the final revision of NEI 07-01, which is the industry's generic methodology for developing EALs for advance passive light water reactors such as the AP1000 design. Permit conditions 4 and 5 require the EAL scheme to reflect the completed AP1000 design details, and permit conditions 6 and 7 reflect the applicable requirements related to as built plant conditions and interfaces with offsite governmental agencies.

To satisfy permit conditions 2 and 3, the applicant committed to the submission of an EAL scheme that is consistent with NEI 07-01 and proposed a licensed condition to ensure that this is done, including offsite agencies

agreement with the EAL scheme. The applicant's submission of a fully developed set of site specific EALs consistent with NEI 07-01 will also meet permit conditions 4 and 5, since NEI 07-01 reflects the AP1000 advanced passive reactor design and the fully developed EALs will reflect the as built plant.

This is also supported by one of the emergency planning ITAAC, which states that analysis of the EAL technical basis were performed to verify as built site specific implementation of the EAL scheme. Finally, permit conditions 6 and 7 will be satisfied because the proposed license condition requires the EALs to be discussed and agreed upon with state and local officials. Next slide, please.

Permit condition 8 requires that the COL applicant referencing the ESP resolve the difference between the Units 3 and 4 common TSC and the TSC locations specified in the AP1000 certified design. The resolution of permit condition 8 is based on the staff's evaluation of the common TSC habitability together with the evaluation of the applicant's requested AP1000 departure and ESP variance.

The TSC must provide an area from which effective direction can be given and effective control can be exercised during an emergency. NRC guidance states that the TSC shall have the same radiological habitability as the control room under accident conditions and TSC personnel shall be protected from radiological hazards to the same degree as control room personnel.

The applicant provided the radiological consequences analysis for the common TSC for the postulated design basis accidents associated with the AP1000 standard design. The results of the analysis demonstrated that the TSC met the control room exposure acceptance criterion.

The applicant also stated that the common TSC will be designed to meet the same habitability requirements as outlined in the AP1000 design control document and that the TSC habitability requirements are included in an ITAAC. The ITAAC addresses that TSC ventilation system including heating and cooling, and activation of the HEPA and charcoal filter system upon detection of high radiation in the TSC.

The staff concluded that the radiation protection design of the common TSC is acceptable and the TSC radiological and non-radiological habitability requirements will be met. Next slide, please.

Consistent with the design certification rule for AP1000, the applicant requested departure 18.8-1, which addresses permit condition 8 and reconciles the TSC location difference between the AP1000 standard design and the common TSC. Specifically, the departure moves the Units 3 and 4 TSCs from the control support area in the annex building to the common TSC in the communication support center. The departure also moves each unit's operational support center into the now available control support area for the respective units.

During its review of the Vogtle ESP application, the staff evaluated the proposed common TSC for Units 3 and 4, and found that from a support and functional standpoint the common TSC was acceptable subject to demonstration of adequacy during the full participation exercise. Unit 3 ITAAC provides for this demonstration. The staff's ESP stage evaluation of the common TSC is described in section 13.3 of NUREG 1923, the ESP final SER.

Finally, the COL applicant requested a variance from the ESP, which moved the TSC location within the protected area by about 150 feet. The staff found

that this relocation did not materially change the basis for the TSC's compliance with applicable requirements and therefore was acceptable. Next slide, please.

With respect to a common TSC for all four Vogtle units, the ACRS asked the applicant to address the capability of TSC equipment and data displays to clearly identify and reflect the affected unit during an incident at the Vogtle site. In response, the applicant proposed an additional Unit 3 ITAAC acceptance criterion. This addressed the demonstration of the capability of TSC and EOF equipment, and data displays to clearly identify and reflect the affected unit. The staff reviewed this acceptance criterion and found it acceptable, because it was consistent with ITAAC guidance, and NUREG 0800. Next slide, please.

Activities that will occur after the COL is issued will include the licensee's submission of the EALs, detailed implementation procedures for the emergency plan, and the schedule for implementation of the emergency planning operational program. In addition, this licensee must conduct a successful onsite exercise and full participation exercise, and complete all EP ITAAC prior to initial fuel load. Next slide, please.

At the early site permit stage, the staff and FEMA performed a detailed review of the complete integrated emergency plans. This review concluded that the emergency plans for Vogtle's Unit 3 and 4 are adequate, subject to the ESP permit conditions and proposed ITAAC. Staff's review of the combined license stage was limited to the matters not resolved during the ESP review. Without reevaluating the emergency plans, which were fully reviewed and found acceptable at the ESP stage, the staff reviewed the applicant's

resolution of the ESP permit conditions and COL action items. Staff found that all of the ESP permit conditions and COL action items were adequately addressed. As required by Part 52, the Emergency Planning ITAAC from the ESP carried forward into the combined license.

The staff concludes that there are the reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at Vogtle Units 3 and 4. And now Eric will continue with the Chapter 13 presentation on the staff's cyber security review.

ERIC LEE: Thank you. Thank you. Good morning. My name is Eric Lee and I'm a Senior Security Specialist with the Cyber Security and Integrated Response Branch in the Office of Nuclear Security and Incident Response. I have been working on the NRC cyber security programs since 2002. This work includes leading the NRC's first pilot study on cyber security at four nuclear power plants, reviewing the nuclear power industry's first established security program guidance document NEI 04-04. Cyber security programs for power reactors and developing regulatory guide 5.71, cyber security programs for nuclear facilities which I will refer to hereafter as the regulatory guide.

My colleagues and I have been heavily involved in the development of the regulatory guide and related cyber security policies, and in the evaluation of licensees and applicant's cyber security plans for complying with the requirements of 10 CFR 73.54, protection of digital computer and communication systems and networks. This includes the review of Vogtle's cyber security plan, which was the first cyber security plan review that the staff completed for a new reactor application. The review, which I will discuss more in detail in a later slide, took more than a year.

I also have with me Mr. Michael Shinn, a subject matter expert in the field of cyber security who has been instrumental in supporting the agency's cyber security program in recent years. His involvement includes providing technical support in the development of regulatory guide Part 73 cyber security licensing reviews and a variety of related cyber security policy efforts.

Today, we will discuss the staff's review of Vogtle's cyber security plan as well as a brief history of the NRC's cyber security regulations and activities to date. Second slide, please.

In response to the terrorist attacks of September 11, 2001, and subsequent information provided by intelligence and law enforcement agencies, the NRC issued orders to enhance the physical and cyber security at nuclear power plants to address the threats environment at the time. This was the beginning of the NRC's involvement in cyber security at nuclear power plants.

Cyber security threats represent a new and unique challenge for nuclear power plants. Previously, nuclear power plants have implemented safeguard measures to protect against credible physical threats with the intent of preventing physical access. However, with the growing use of digital systems in nuclear power plants, adversaries may not need to have physical access to the plant to cause harm. The well publicized Stuxnet cyber attack in 2010, which was directed against the Iranian nuclear facilities demonstrates that adversaries can cause harm without direct, or even physical access, to digital systems in nuclear power plants. By the way, the regulatory guide has numerous security measures to address the types of attacks that made Stuxnet as possible.

Recognizing the potential rise in cyber threats and cyber related issues resulting from increased use of digital technology at nuclear power plants, NCR initiated a cyber security pilot study at four nuclear power plants in 2002. The purpose was to develop a method that licensees could use to manage cyber risk at nuclear power plants. The results of the study were published in NUREG CR6847, in 2004. This study provided NRC with a preliminary method for evaluating the risk to individual systems in nuclear plants. Based on additional research and lessons learned from trial and error, the NRC determined that a more comprehensive method was required to adequately protect nuclear power plants. This evolution, which I will discuss momentarily, resulted in the method used in the regulatory guide.

In 2005, industry took the initiative to develop NEI 04-04, using the method provided in NUREG CR6847 and insights gained during the pilot study. This was the industry's first standard approach to cyber security. The purpose of the document was to provide operating reactor licensees with the guidance for developing and maintaining a cyber security program at their facilities.

Finally, in 2007, the NRC revised design basis rule and published regulatory guide 5.69, which is not publically available, to describe the enhanced characteristics of adversaries, including the use of a cyber attack against nuclear power plants. Next slide, please.

In January, 2009, the Commission issued 10 CFR 73.5454 cyber security regulations for nuclear power plants. This regulation is high level performance-based and programmatic, and is consistent with other security regulations such as the physical security regulations. 10 CFR 73.54 requires licensees to provide high assurance that digital computer communication systems

and networks associated with safety, important to safety, security, and emergency preparedness functions and support systems that if compromised would adversely impact safety, importance of safety, security, or emergence of preparedness functions are adequately protected from cyber attacks up to including design based threats. These systems are referred to as critical digital assets or CDAs. Next slide, please.

To provide high assurance that CDAs are adequately protected from cyber attacks, regulation requires licensees to implement Defense-in-Depth strategies. These strategies include the following: One, implementing multiple protective security boundaries so that you can delay, detect and respond to a cyber attack; two, implementing cyber security controls to address known credible and applicable potential vulnerabilities that adversaries can use to compromise CDAs; three, implementing cyber security incident response and mitigation programs to mitigate the consequences of a successful cyber attack; and four, implementing maintenance programs to ensure that established cyber security programs are continuously effective against currently known applicable vulnerabilities and newly discovered applicable vulnerabilities.

Finally, the regulation requires licensees to submit their established security plans to the Commission for review and approval. The plan must describe how licensees will implement and maintain their established security programs to provide high assurance that CDAs are protected from cyber attacks. Thus, once the Commission reviews and accepts a plan, it becomes a condition of the plant's license. Therefore, the cyber security plan becomes a part of the plant’s licensing basis, just like the physical security plan.

Cyber security plan must also account for site specific conditions

affecting the implementation. Additionally, it requires policies, implementation procedures, site specific analysis, and other supporting technical implementation used by the licensees are not required under 10 CFR 7354 to submit to the NRC for review and approval as part of the cyber security plan. However, they are subject to inspection by NRC's staff on a periodic basis. Next slide, please.

In January, 2010, the NRC issued regulatory guide. The regulatory guide is designed to provide a standard based method that the licensees can use to establish cyber security programs for nuclear power plants to comply with the cyber security regulation. The regulatory guide includes 148 security controls that provide safeguard measures to address known potential root causes or vulnerabilities that adversaries can use to compromise CDAs. The regulatory guide also includes a template that licensees and applicants may use to develop their cyber security plans for the NRC's review and approval. Next slide, please.

The regulatory guide was developed based on insights gained since 2002 dealing with cyber security, as well as insights from cyber security experts and industry. Additionally, the regulatory guide was developed based on an already well-established foundation of security controls provided in NIST special publication, 800-53 and 82. These standards are based on several decades of ongoing work and research in cyber security. The process National Institute Of Standard And Technology, NIST, used in developing these standard is public and allows for input from all industries as well as outside cyber security experts. It was partially because of the widespread consensus in these standards that the NRC choose to use them as the starting point for the

development of the regulatory guide. The methods using these standards are well understood, widely peer-reviewed and have decades of operating experience that has informed the evolution of the standards. The approaches securing any systems from cyber attack embodied in these standards are also known to be effective. Because of this, these standards are widely used to protect our most sensitive systems in the U.S. government as well as used by other industries to implement cyber security programs for their needs. Next slide, please.

The regulatory guide was thoroughly vetted by the nuclear power industry. It has also been reviewed by DHS, NIST, NERC, FERC, and cyber security experts since its publication in 2010. As a result, other agencies and cyber security experts commonly reference the regulatory guide as a sound way to develop cyber security programs at their facilities.

For example, NERC has stated that sites that implement the regulatory guide meet NERC's cyber security requirements, and the regulatory guide is equivalent replacement for the NERC CIP standards. DHS has included the regulatory guide's security controls in its CSET tool which it uses to assess the security posture of facilities and makes it available to outside parties to perform their own assessments. While participating in the DHS Software Assurance Working Group earlier this year, DHS used the regulatory guide as an example of a security program that other organizations should implement. And specifically singled out the NRC as an organization leading the way on this subject. At the recent Cyber Security at Nuclear Facility Conference at the University of Maryland, numerous cyber security experts provided their support for the regulatory guide as a sound method for securing

nuclear power plants from cyber attacks. Next slide, please.

The Vogtle COL applicant submitted its cyber security plan to the NRC accordance with the 10 CFR 73.54. Following several RAIs and face-to-face meetings involving NRC staff and Vogtle representatives to discuss technical issues within the plan, the applicant ultimately submitted an updated cyber security plan based on the template provided in the regulatory guide. Although the applicant submitted cyber security plan essentially followed the template provided in the regulatory guide, the submitted cyber security plan did include some deviations from the template. The staff met with the Vogtle's representatives several times to discuss technical issues associated with the deviations. The purpose of the deviation was to account for a site specific design and processes that the applicant will use to comply with the cyber security rule. Most of the deviations were minor in nature. For example, Vogtle deviation from the template to clarify in its cyber security plan that flexibilities associated with implementing security controls provided in the regulatory guide are reflected when security controls are discussed in the applicant's plan.

The only significant, but anticipated, deviation within the Vogtle cyber security plan was located in the section describing the site's cyber security architecture. Guidance contained in the regulatory guide provides for a defensive architecture that includes multiple cyber security defensible layers separated by security boundary devices such as firewalls and data diodes that restrict digital communication in a manner that protects CDAs from cyber attacks. The anticipation for deviation in this particular section of the cyber security plan is based on staff's expectation that each licensee will

describe their site-specific cyber security architecture which may be different from the example provided in the regulatory guide.

Since Vogtle's cyber security architecture is unique to the design of AP1000, its cyber security architecture does not exactly fit the example as described in the regulatory guide. Therefore, the staff evaluated whether the cyber security defensive architecture outlined by Vogtle in its cyber security plan effectively protects CDAs and provides multiple defensive security boundaries comparable to what's described in the regulatory guide. Although it is not possible in a public setting to specifically describe the applicant's architecture, we can say that the cyber security architecture provided in Vogtle's cyber security plan provides no less protection than the example provided in the regulatory guide, and therefore staff concluded that the deviation is in compliance with provisions set forth in the cyber security regulations. Next slide, please.

As we explained in the example, the staff evaluated each deviations. And keep in mind that whether deviations maintained the intent of template section and did not reduce protection for CDAs. After detailed review, the staff determined that deviations did not alter the plan in a way that lessened or reduced the level of protection for CDAs. Therefore, the staff found that Vogtle -- therefore, if Vogtle implements its cyber security plan as described, systems at the Vogtle plant within the scope of the cyber security regulations, will be adequately protected from cyber attacks.

Additionally, the Vogtle cyber security plan is expected to be used by other applicant design centers. The staff's evaluation is provided in Section 13.8 of the FSER. This completes my presentation on

cyber security. I will now turn back to Denise.

DENISE MCGOVERN: I will now present the staff's review of the Vogtle COL for Chapter 9 auxiliary systems. I'll start with the information incorporated by reference from the AP100 DCD and which we'll discuss here to provide context for the COL review. Slide 22, please.

I will continue with a couple items that the COL applicant addressed in the Vogtle FSAR Chapter 9. Slide 23, please.

This slide summarizes some of the topics from the AP1000 DCD, Chapter 9 which are incorporated by reference into the Vogtle Chapter 9. For this presentation, as an example of an IBR topic, I will describe the spent fuel pool storage. As part of the AP1000 DC amendment, Westinghouse increased the number of assemblies that could be stored in the pool from 619 to 889. And as a result, Westinghouse performed new analysis in several areas. Next slide, please.

In the initial AP1000 design certification there had been a COL item for confirmatory structural analysis of the fuel storage racks to be provided by the COL applicant, but as part of the design certification amendment, Westinghouse provided a new design and the staff performed a detailed review including audits and confirmatory calculations. The staff concluded that the structural design of the pool met applicable regulatory requirements. And this topic is no longer needed to be separately addressed by COL applicants referencing the AP1000 design. Next slide, please.

With respect to spent fuel pool cooling, as a result of the additional number of assemblies, Westinghouse updated the AP1000 thermal analysis to show adequate spent fuel pool cooling for normal and accident

conditions. The spent fuel pool capacity is 190,500 gallons of water, although there is a two-train, AC-powered, non-safety-related, spent fuel pool cooling system, the safety analysis credits the thermal capacity of the tech spec controlled volume of water from the pool with some other connected water sources such as the cask wash-down pit to maintain the fuel in a submerged and cool condition. Pool water level instrumentation is safety-related, is controlled by tech specs, and is alarmed in the control room. Two spray headers were added to the pool as part of the amendment. The scenarios Westinghouse analyzed included blackout, seismic, and emergency fuel core offload. Next slide, please.

The spent fuel storage racks can hold a total of 889 assemblies. There are two regions in the pool: region one, with 243 assemblies, and region two with the remaining. Region two has a higher density of assemblies, and the criticality analysis for that region considers poison panels which are Metamic -- which are boron materials to absorb neutrons, soluble boron and credit for fuel burnup. Westinghouse's analysis was done in a manner consistent with present staff review guidance. A separate analysis was also done to show the pool remained sub-critical if flooded with un-borated water. Next slide, please.

This table describes the scope of the staff's COL review for Chapter 9. In the next slide, I will summarize the staff's review of each of the topics of interest for the COL review, namely the Metamic coupon monitoring program and the raw water system. Next slide, please.

Initially, the applicant did not provide sufficient detail of the Metamic coupon surveillance program for the spent fuel pool neutron-absorbing

material. This was due to limited service experience with the material. However, the applicant subsequently revised its FSAR to include additional details of the program, which the staff evaluated in Section 9.1 of the FSER. The applicant's program includes tests to monitor for blistering, bubbling, cracking, or flaking, as well as a test to monitor for corrosion of the spent fuel pool neutron absorbers. The need for this coupon monitoring program arose from experience in the operating plants in which similar neutron-absorbing materials were found to have degraded over years of operation. The staff proposed a license condition that requires the implementation of a Metamic coupon-monitoring program prior to initial fuel load. The licensee will have a monitoring program in place during plant operation to detect any potential degradation of the neutron-absorbing material. Next slide, please.

The AP1000 DCD does not describe the design of the raw water system. DCD Chapter 1 states that the raw water system is wholly out of scope. Therefore, SNC provided the detailed design of the site-specific raw water systems. The raw water system is classified as non-safety-related. The raw water system serves no safety-related function and therefore has no nuclear safety design basis. Raw water system is broken down into two subsystems, the river water subsystem and the well water subsystem. The river water subsystem, the source is the Savannah River. For the well water subsystem, the source is from onsite deep wells. The raw water system supplies water to many users including the service water system cooling towers, fire protection systems, circulating water system cooling towers, and circulating water system pumps. It also supplies dilution water for rad waste discharge if the circulating water system is not available. This is just a partial list to give you a few

examples. Next slide, please.

The staff reviewed the applicant's FSAR and issued RAIs regarding the design of the raw water system. The staff's review focused on GDCs 2 and 4 to ensure that the facility and the raw water system and the components will not adversely affect the ability of other systems to perform their intended safety-significant functions. The applicant responded that the raw water system does not directly interface with any safety-related systems and is not routed in close proximity to safety-related SSCs. The majority of the piping is routed underground, and any flood resulting from a break in the raw water system piping is bounded by the analysis for a break in the circulating water system piping. The flood analysis for the CWS in the yard ensures that the potential water sources are located far from safety-related SSCs and also that the site grade would carry water away from them.

In summary, the staff concluded that the failure of the raw water system or its components will not affect the ability of any safety-related SSCs to perform their intended safety functions because the raw water system is not located in the vicinity of any safety-related SSCs, and the water from the postulated break will not reach them. Next slide, please.

The staff review also focused on 10 CFR 20.1406 to ensure that the raw water system is adequately designed to prevent contamination at the facility and environment. The applicant stated in the RAI response that contamination of the raw water system piping is not plausible based on the raw water system design -- it's pressurized -- and because the raw water system has no direct interconnection with any system that contains radioactive fluids. The staff concluded that the contamination of the raw water system is not

credible due to its configuration relative to potential sources of contamination and meets 10 CFR 20.1406. Next slide, please.

And now for the staff review of Vogtle COL Chapter 12 Radiation Protection. Next slide, please.

This table describes the scope of the staff review of Chapter 12. One the next slide, I will summarize the staff's review of the topics of interest including minimization of contamination and radiation exposure of construction workers. Next slide, please.

The AP1000 DCD described the AP1000 plant design in compliance with 10 CFR 20.1406, Minimization of Contamination. However, it's the COL applicant's responsibility to describe its operational programs and site-specific information that demonstrates regulatory compliance. SNC revised the Vogtle FSAR to adopt NEI 08-08A. This document describes how the facility design and procedures for operation will minimize to the extent practical contamination of the facility and the environment. This information was reviewed by the staff and is consistent with Reg. guide 4.21. SNC agreed to develop a groundwater monitoring program whose scope goes beyond the normal effluent monitoring program typically used in current operating plants. SNC also provided site-specific information describing design features associated with exterior radioactive waste discharge piping. These features are implemented to control the unplanned or undetected release of radioactivity from that system. This information is described in Sections 9.2 and 11.2 of the Vogtle FSAR. The staff's review of the applicant's information provided in the FSAR confirms that the applicant meets the requirements 10 CFR Part 20.1406. Next slide, please.

The applicant was requested to describe the expected radiation exposure to the construction workers building Vogtle Units 3 and 4 from all radiation sources during construction. These workers would be considered members of the public under 10 CFR 20.1301, and the staff asked the applicant to provide the basis for these dose estimates. Accordingly, in Vogtle FSAR Section 12.4, SNC described the contributions to construction worker dose from the various direct radiation sources, including the existing Vogtle Units 1 and 2 and proposed independent spent fuel storage installation and the planned Vogtle Unit 3.

In addition, SNC described the contributions to construction worker dose from gaseous and liquid effluents release during the normal operations of Vogtle Units 1 and 2. Since the exposure to construction workers completing the Vogtle Unit 4 would be the most conservative or bounding, it is discussed in more detail.

SNC estimated that the annual whole body dose to a Vogtle Unit 4 construction worker from all radiation sources would be approximately 23.8 millirem. This dose is well below the 100 millirem per year limit to members of the public. In Vogtle's FSAR Section 12.4, SNC also addressed the conduct of surveys in uncontrolled and restricted areas to implement 10 CFR 20.1302 and demonstrated compliance with the standards of Part 20.1301. The staff's review of the applicant's information provided in the FSAR confirms that the applicant meets the requirements of 10 CFR Part 20.1301.

And now the staff review of the Vogtle Chapter 14 Initial Test Program. Next slide.

This table describes the scope of staff's review of Chapter 14. In

the next slide, I will summarize staff reviewed two topics, first plant-only tests and first three plant-only tests. Slide 38.

The first plant-only tests are special prototypical tests that establish the performance parameters of the unique design features of the AP1000 standard design that will not change from plant to plant. Because of standardization of the AP1000 design, once such a test is successfully completed, it will not be required of subsequent plants. There are seven tests shown on the next slide for your reference, but I do not plan on discussing them in detail. Some of the tests are conducted post-fuel load.

For this Vogtle COL, the staff has proposed a license condition to cover the entire startup testing program during pre-operational testing and power ascension testing. All licensees that reference the AP1000 design will have to perform special tests or first-three plant tests unless they request a license amendment based on an acceptable result which is applicable to their plant. Next slide, please.

So this is the list of tests that I'm not going to discuss. All of these tests will be required by license condition. Next slide, please.

The first three plant tests will verify the performance of the AP1000 design features and do not change the design parameters or operation of the AP1000 plant. In addition, these tests are intended to confirm consistent passive system functions prior to allowing a subsequent COL to admit performance of the testing. There are two first three plant-only tests. They are the core makeup tank heated recirculation test and the automatic depressurization system blow down test. Both tests are performed prior to fuel load. Once again, a license condition is proposed to cover these tests during

the pre-operational testing. This concludes the staff's overview of this panel and the safety review.

CHAIRMAN JACZKO: Well, thank you. I want to start with the question on the EALs that I'm just a little confused why they're not specified at this point.

DENISE MCGOVERN: I will call on my colleague from Emergency Planning.

BRUCE MUSICO: Good morning. My name is Bruce Musico. I'm a senior emergency preparedness specialist. I was the reviewer for the Vogtle application for the emergency plan. What was the question again, please?

CHAIRMAN JACZKO: Well, we have a license condition that specifies the completion of the EALs within 100, 180 days of some period of -

BRUCE MUSICO: Yes, 180 days.

CHAIRMAN JACZKO: It's unclear to me why that they're not already specified.

BRUCE MUSICO: They're not specified because a lot of them are based on the as built aspects of the plant systems and equipment.

CHAIRMAN JACZKO: Okay, give me a little more -- give me a little bit more about that.

BRUCE MUSICO: Well, the EALs are basically -- it's a scheme that has certain triggers that initiate actions with respect to an emergency preparedness program.

CHAIRMAN JACZKO: Yeah, I know what the EALs are, but not -- I mean -- so we don't know specific parameters at this point, insufficient details in the EALs?

BRUCE MUSICO: There are some that we don't know yet. So there's a structure in NEI 0701 which is from industry with respect to what they'll look like. And a lot of them could be specified at this time, but the complete scheme is not available yet.

CHAIRMAN JACZKO: Does Part 52 require the EALs to be submitted at the application?

BRUCE MUSICO: No, no. Part 50 requires the submission of the EAL scheme. Part 52 doesn't address it. What Part 52 does, with respect to emergency planning, it refers you back to the requirements to Part 50.

CHAIRMAN JACZKO: Right. And 50.47 includes -- so it includes -- so it requires the specification of the scheme, not of the EALs themselves?

BRUCE MUSICO: Well, EALs are part of the scheme. And EALs, you have certain equipment and system triggers that will initiate certain actions which result from classification, one of the four classifications of emergencies at the plant.

CHAIRMAN JACZKO: Okay, so it may be a -- maybe I can just get a written kind of answer to this. You said, just as I tracked through it, Part 52 requires that -- the requirements of 50.47 are included in the application. I thought that included the requirements for the EALs too.

BRUCE MUSICO: Maybe I could expand on that. It does. But that's why we have a license condition that they'll have to submit at 180 days prior to fuel load, so we'll have a chance to review them prior to loading fuel.

CHAIRMAN JACZKO: Right, and again, I don't want to belabor this. We have some other questions but the requirement in Part 52 is in the content of the application, so the information was not included in the application, so

presumably there would have been an exemption to 52- whatever-it-is – 52.79 - 20-something, whatever it is.

BRUCE MUSICO: No, no. The requirement for the EALs, when we do get them, again, they'll be evaluated against -- they'll be consistent with NEI 0701. We'll evaluate the adequacy of them at that time.

CHAIRMAN JACZKO: Well, yeah -- I still have other questions I want to get to. I'm -- you can give me a writing of a better explanation of why they weren't included in the application, but I don't want to belabor --

BRUCE MUSICO: We can do that.

CHAIRMAN JACZKO: Okay, good. Thank you. I wanted to turn to the applicant for a moment. And I'm not going to ask the staff anything about this because I promised Mike Johnson I would never ask about ITAAC again, but I didn't promise I wouldn't ask the applicant about ITAAC. So we've had a lot of discussion -- well, let's say I've had a lot of discussion about ITAAC and I worry a little bit about lack of clarity when we get into an important phase of when we issue a license and we're in a phase where we're trying to resolve ITAAC and we've had confusion about what ITAAC means. And in some cases, I think that there is a tremendous amount of vagueness in the ITAAC which could lend itself to confusion about what they ultimately need.

So I asked a question in the pre-hearing questions and hopefully you've all received copies of pre-hearing questions. I believe -- and I asked how we would resolve disagreements. And it's particularly asked how we would ultimately compel an applicant to perform a different test inspection or analysis if, one, that either that the staff had done was inadequate, especially in those cases where we didn't specify a particular test, or it was

just a generic statement that a test will be performed, something to that effect, which to my surprise appears to exist in more ITAAC than I was aware. And the staff's response, they stated that ultimately -- and this is almost a direct quote -- the NRC is responsible for interpreting requirements of the ITAAC.

So I'll ask you as the applicant, do you concur that ultimately the staff is responsible for interpreting the requirements of the ITAAC? A simple yes or no would do. I'll take that as a yes.

WESLEY SPARKMAN: Well, we both have the requirement, but they ultimately have the requirement to ensure that it's done, and we have to meet what they require of us. So we are required to meet the requirements of the ITAAC, but it --

CHAIRMAN JACZKO: "But" is no answer. If the answer's no, that's fine. You just tell me yes or no. The statement that the staff made is that ultimately the NRC is responsible for interpreting the requirements of the ITAAC. So do you agree with that statement or not?

CHUCK PIERCE: This is Chuck Pierce, Southern Nuclear. We agree with that statement.

CHAIRMAN JACZKO: Okay, thank you. I want to touch on -- I won't touch on it [unintelligible]. Commissioner Svinicki?

COMMISSIONER SVINICKI: Thank you. I'll also begin with a question for the applicant witnesses. Could you elaborate on the operating experience that you evaluated with respect to the Metamic and explain somewhat at a high level but with some specificity why you are confident that the coupon monitoring program that you developed and that the staff accepted will ensure

that there is no unacceptable degradation over time in this material?

WESLEY SPARKMAN: With respect to that material, there is not a lot of data, but we do believe that having a program that will monitor it on an ongoing basis would capture, in addition to operating experience, would capture anything that we need to capture to ensure that we can catch any degradation in time to prevent it from causing any issues with it.

COMMISSIONER SVINICKI: So it's -- is it accurate to state that the development of your monitoring program was more focused on a bit of an early warning system or catching degradation, not necessarily just proof of preventing degradation but catching it if it does occur because there is, as you stated, not as much experience and data on this material at this point in time?

WESLEY SPARKMAN: That would be correct.

COMMISSIONER SVINICKI: Thank you. For the staff, I think, Eric, this would be a question for you. You discussed the deviations. I don't know if you gave a figure. I have a figure. I'm not sure that it's right, taken from regulatory guide 5.71. The applicant cyber security plan -- characterizes nearly all of those deviations as being minor. You did indicate that there was one non-minor deviation. But I also understood the case to be that many of the deviations, even the minor ones, are technology specific or relevant to the AP1000, and I also understand that the staff will inspect the cyber security plans for other AP1000 applicants either to have taken or take in the future similar deviations. Is the staff giving any consideration to the development of a technology-specific or AP1000-specific kind of subchapter to Reg. Guide 5.71 that could eliminate the need for NRC to review and grant all of these

non-minor and minor deviations and eliminate the need to grant these repeatedly? And some, you know, are often confused of why we have to grant deviations and exceptions from things. Does that give any programmatic consideration to the development of the technology specific Reg. Guide for the AP1000?

ERIC LEE: No. The regulatory guide is a guide that is written for all different types of technology, and it provides a framework and currently know address the currently known vulnerabilities and root causes that could be used by the adversaries to cause, you know -- compromise our [unintelligible] or assets. And so part of philosophy that we follow using the NIST standard and it applies to all different technology, so it could be continuous.

COMMISSIONER SVINICKI: Well, and this isn't something that is germane to the regulatory findings that need to be made for this mandatory hearing. It's a bit of a programmatic tangent. I'm sure the staff is aware and the Commission is very aware that many of the agency's external stakeholders feel that our repeated granting of deviations and exceptions is a failure of our regulatory program, so, I point out that if a substantial number of deviations have to do with the fact that they simply have no applicability to the AP1000 then it's -- it just makes the statistics look a certain direction and I don't think it's accurate. You don't need to make a comment on that. Could you describe very generally the difference of how staff decided certain tasks would be the first three plant versus the first plant only? I think, Denise, you have a very general description of what fell in each category, but were there any judgment calls that you made and something could have been the first plant to the first three was a bit of a judgment call?

JUAN PERALTA: Good morning. Juan Peralta, Chief vendor of inspections, Office of New Reactors. Well, these decisions were made back when the AP600 was being reviewed. There's a lot of judgment call because some of these tests are transient, so yes, there was a consideration, one was practical at the time and which ones where we more comfortable respect to tests in the test facilities, which ones we need to observe at the actual test site. So there was a lot of judgment call and back and forth in discussion with the applicant at the time.

COMMISSIONER SVINICKI: But overall this was -- at the end of the day, was it pretty much a consensus to you amongst the staff of which should be the first plant, the first three plants, was there any -- there weren't any non-concurrences or anything?

JUAN PERALTA: Absolutely not.

COMMISSIONER SVINICKI: Okay. Thank you very much. And then I hope this -- perhaps the applicant could address this quickly in my remaining time, but between the issuance of the ESP and the COL application, the locations of the operations support center and the technical support center changed, could you briefly describe what prompted those changes? This is for the applicant.

THEODORE AMUNDSON: The actual change was just to the TSC only.

COMMISSIONER SVINICKI: Okay.

THEODORE AMUNDSON: From the time of the application, from the ESP application, basically the -- at the time of the ESP application, we had prepared preliminary design for support buildings such as the building that would house the technical support center. Between the time of the ESP

application and the COL application, those designs were refined and modified somewhat and so we had to reflect the change in the design of those support buildings and the location of those support buildings, and that prompted the variance that we submitted as part of the COL application.

COMMISSIONER SVINICKI: And do I recall a figure correctly from the staff's presentation, was it I think Denise said 150 feet?

THEODORE AMUNDSON: 150 feet is correct.

COMMISSIONER SVINICKI: Okay, thank you. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Apostolakis.

COMMISSIONER APOSTOLAKIS: Thank you, Mr. Chairman. This is a question for Eric. The ACRS in this letter notes the level of protection designated for the technical support center is lower than that for the units and I understand that you had the give and take with ACRS with that. Will you briefly tell us what this is about?

ERIC LEE: Yes, sir. During the presentation to ACRS, there was some discussion as to whether TSC is critical digital asset or not. But, as we have explained in our presentation, the cyber security plans is supposed to -- regulation requires licensees to submit cyber security plan and cyber security plan supposed to describe how they are implementing their cyber security program to provide high assurance that critical digital assets that are protected from cyber attacks, and also the regulation requires that -- let me read actually – additionally the cyber security regulation states that the policies, implementation procedures and site specific analysis and other supporting technical information used by the licensees, and that needs to be submitted for Commission's review and approval as a part of the cyber security

plan. But they are subject to NRC's periodic inspections, so at this time -- as a part of the cyber security plan it is not necessary for them to, you know, make that determination. However, what they have give us in the cyber security plan is that criteria that will be used to identify what systems are within the scope of a -- in a CDA and what systems are not. So at this time, we have that during inspection time, we will determine whether they have applied those criteria properly or not.

WHEREUPON,

CRAIG ERLANGER

was called as a witness for the staff of the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

CRAIG ERLANGER: Good morning, everyone, my name is Craig Erlanger. I'm the chief of cyber security and integrated response branch. I'm a sworn in witness. Sir, I was at that meeting when the question was posed and at the time the applicant proposed where they felt the TSC would fit in their defense of architecture. What is important to note is that regardless of where the assets actually fits -- in this case technical support center -- all the cyber security controls that are outlined in regulatory guide will be applied thought of throughout the process, so when the applicant eventually makes its determination where the technical support center will sit in its architecture, as Eric mentioned, we will look at it in inspection, but the bottom line is they have to go through the process of applying all the security controls outlined in the Reg. Guide. We can't speak today. We did not review where individual assets fell in the architecture but as Eric mentioned, in the

oversight program, that's one of the elements we'll look at.

COMMISSIONER APOSTOLAKIS: Is it true that the level of protection is lower?

MICHAEL SHINN: This is Mike Shinn. No, the level of protection is not lower as Mr. Erlanger stated. All CDAs must address all of the security controls in the cyber security plan.

COMMISSIONER APOSTOLAKIS: So it appears that the committee and you agree that this is a generic issue. So how can it not be lower and be a generic issue? That's what it says here. The [unintelligible] -- this will be addressed in the [unintelligible]. This is a potential generic concern, there will be special meetings with subcommittee of the ACRS and discuss it. Is that consistent with what you just said? The level of protection is not lower?

CRAIG ERLANGER: Commissioner, this is Craig Erlanger again. I think in one respect that question to fall to the applicant, where they decided -- when they eventually decide where they're going to place that in the architecture. Again, all of the security controls, they go through a process where each are applied to a critical digital asset. Today, I can't answer you where they determine it's going to fall. They may not know where they can -- they may not be at that stage but it will be addressed. I don't believe it's a generic issue at this time.

COMMISSIONER APOSTOLAKIS: Yes, sir?

JERRY SIMS: We will have to communicate at the TSC with the county, a state, a lot of local people who will have digital systems that will be interfacing with the TSC. The TSC will be at a level 2, which is a level that's lower than the other levels - for the critical systems. But as Craig

has noted, there will be interface between those systems that will be controlled through the cyber security controls to ensure that those higher levels are not exposed because of the level 2 communication and data transfer occurring at the level 2.

COMMISSIONER APOSTOLAKIS: I would appreciate a written response, because I must say -- it's not very clear to me what exactly would happen.

CRAIG ERLANGER: No problem, we can do that. What I will offer to build on Mr. Sim's comment is what you read in the Reg. Guide is an architecture that has multiple levels at the higher levels, what is espoused is one way communication. What Mr. Sims is alluding to due to the function of the technical support center there is a need for bidirectional communication, probably part of the rationale of why the applicant decided to put it on that level. But again, all the security controls are applied but there is a need for bidirectional communication. And we will provide you with a written response.

COMMISSIONER APOSTOLAKIS: What does the applicant gain by declaring level 2 protection rather than 3 or 4? Is it really that expensive or what is it?

JERRY SIMS: Well, we're required by a regulation to be able to communicate that data to all these other agencies. So we don't have control over their circuits. So because we're required to communicate with them, then that takes place at the level 2.

COMMISSIONER APOSTOLAKIS: Level 2, [inaudible].

JERRY SIMS: But, we are protecting the exposure that that would create to the higher levels relative to a cyber security attack vector or

something like that.

COMMISSIONER APOSTOLAKIS: Thank you very much. Thank you. Thank you, Mr. Chairman.

COMMISSIONER MAGWOOD: Thank you, Mr. Chairman. Stay on cyber security for a moment. I appreciate your history of the evolution of the cyber security. It's a good dissertation. You pass on the history.

[laughter]

COMMISSIONER MAGWOOD: The -- I was reviewing 73.54 and it's -- I'll just read a little part of it here. It says in paragraph (a)(1): Licensee shall protect digital computer and communication systems and networks associated with safety related important safety functions, security functions and emergency preparedness. And that's interesting because it speaks very clearly to protection of the cyber systems. Much of what we do at NRC is focus on protecting the core. This is a little bit different. However, I noticed that the license condition related to the cyber security program, which is condition 2D-11, indicates that the cyber security program has to be in place prior to fuel load. And I wonder if you can explain whether there is a window of vulnerability from our standpoint as to whether the cyber security program has been verified and in place, after the systems have been installed, because seems to me the systems to be installed long before the fuel's been loaded, so what's -- what's happening in that in-between period?

ERIC LEE: The -- let me collect my thoughts before I --

COMMISSIONER MAGWOOD: You've got some help up there if you want it.

[laughter]

CRAIG ERLANGER: Sir, I'll start off the response, and Eric and Michael, please chime in if I miss anything. There's also an additional license condition that adds that one year after license is granted, the applicant, who will then be a licensee, will submit a implementation schedule and continue to submit that implementation schedule up until I believe it's six months prior to fuel load. That will afford the staff the opportunity, as we develop our oversight program and have interaction with the licensee to understand what systems have been implemented and whether it would be appropriate to go out and do an inspection. But again we're not -- the intent is not to wait until six months prior to fuel load to go out there, and then they've gone down a path that can't be corrected or there's a problem.

COMMISSIONER MAGWOOD: So then why have the license conditions and cyber security program be in place at fuel load instead of at some point --

CRAIG ERLANGER: Another element, as well as it's consistent, it's a milestone is consistent with the physical security program. It's important to note that 73.54 the cyber security plan and program implementation is tenet over the overall physical protection strategy is one of four security plans and consistency of milestones implementation. That's why the whole entire physical security program will be in place at that time.

COMMISSIONER MAGWOOD: Okay, I want to think about that bit further, though. I'll take that for now and move on to something else.

Talk about emergency planning. There's -- as you highlighted in your presentation, there's an ITAAC that requires full participation exercise within I think, Appendix E says two years prior to fuel load. One question I have about that is, I haven't seen these any specificity -- maybe I should

direct this to the applicant first, and I'll come back to the staff at another point. Is there any clarity as to when that test will actually be scheduled? I know it has to be two years prior. Can you define that at this point?

THEODORE AMUNDSON: Yes, we have. We have to work with the state and local agencies, federal agencies including the NRC and FEMA for the conduct of exercises that we conduct throughout the fleet throughout the region. We meet periodically with those agencies. We look ahead, we plan when are we going to have to have those exercises conducted. And on a preliminary basis, we put a place keeper in for Vogtle Unit 3's exercise for January of 2015.

COMMISSIONER MAGWOOD: Thank you. Appreciate that. For the staff. What's FEMA's role in that -- at that point, I assume? FEMA -- this will be part of the emergency planning program at that point, so FEMA will evaluate the exercises as it evaluates all the other exercises, so does that require FEMA's evaluation to be complete, and provided to the NRC before the ITAAC can be closed?

BRUCE MUSICO: Yes.

COMMISSIONER MAGWOOD: Okay. Appreciate that. At one point. And I think this is less -- this is partially an emergency planning question, partially a TSC question. One of the requirements of TSC is that there be easy access between the TSC and the control room. We've talked already about how the control room and TSC both have to have a habitable environment in case of a severe accident. Now, the way the TSC is located, the orientation, the TSC -- the control room there's a distance, it's not a great distance, but it's a distance. And I think there was something in the SER about there being a motorized vehicle could be available to transport people back and forth as

necessary? In the event of a severe accident, how would you handle exposures of personnel who had to go back and forth? Would you go back and forth or would that just not be necessary if you had the situation where those --

BRUCE MUSICO: That issue was addressed during the ESP proceedings. The ASLB specifically asked about the habitability in transit from the TSC to the control room and back. And there's equipment in place to protect the personnel in the event they have to go from one facility to the other, and that's explained in the Safety Evaluation Report.

COMMISSIONER MAGWOOD: Okay, so there was preparation, there was equipment, so you could get people from one place to the other --

BRUCE MUSICO: Yes. Yes.

COMMISSIONER MAGWOOD: Okay. I'll look into that. Thank you. Thank you. Thank you, Chairman.

CHAIRMAN JACZKO: Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman. I'll also go along with Commissioner Magwood on emergency planning, to start out. The big picture with respect to the Vogtle license and interface emergency planning area, the state, local officials, offsite first responders, were there any significant comments that -- or concerns that were raised – in those areas?

DENISE MCGOVERN: -- Not that I'm aware of but I'll [inaudible].

BRUCE MUSICO: In regard to what, sir?

COMMISSIONER OSTENDORFF: Primarily offsite response -- were the responsibilities of the people that are not part of the utility, but firefighters, police, et cetera that might be called upon to coordinate with the licensee for the offsite piece of this.

BRUCE MUSICO: Not that I'm aware of. It's important to note that the plant currently has an existing operational emergency plan in place. The license for Unit One was issued in 1987. The license for Unit Two was issued in 1987. At that time, they had to comply with the existing emergency planning requirements that were essentially established after the Three Mile Island accident in 1979, and ever since then, for the next 24 years, up until about now, up till now, those emergency plans are in place, they're operational, they're functional, they're periodically tested and evaluated by us as well as FEMA. So I haven't heard anything even --

COMMISSIONER OSTENDORFF: Well let me just -- for time's sake focus on the two new sites down there in the Vogtle proposal, that went from two to four reactors. I should have rephrased the question. Anything in that particular context about going from two to four reactors?

BRUCE MUSICO: From an off-site standpoint, no because essentially nothing changes off site.

COMMISSIONER OSTENDORFF: Okay. Thank you. Let me, Denise, a question on testing, first plant-only test, this is on slide 39. There's a reference to natural circulation test and to my understanding, that basically that test would be conducted in order to demonstrate the unit's ability to cope with a station blackout. And I'm going to ask two questions here. One is, can somebody talk at a very high level about describing that test and to what extent does it mimic a station blackout condition? And the second question is, I believe there are natural circulation tests for existing plants, as part of their licensing back many years ago and how that test might compare to what might have been done for natural circulation tests and existing tests.

WHEREUPON,

JUAN PERALTA

was called as a witness for the Nuclear Regulatory Committee and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

JUAN PERALTA: Juan Peralta, again. Natural circulation of the AP100 is a specific design feature, so it's not the test that is conducted in existing fleet -- it's a unique feature that is part of the design basis of the facility as opposed to the natural circulation in the existing plants. But it's not actually specifically tied to a station blackout. It's simply a thermal-hydraulic test to verify that the behavior of the phenomena in the AP1000 design. There are other tests that will address station blackouts.

COMMISSIONER OSTENDORFF: Okay, is there a relationship between the other tests and station blackout and natural circulation test referred to for the first --

JUAN PERALTA: No, not explicitly no. This is one aspect of the passive core cooling system that is done, only to verify behavior at that stage. There's a separate test for station blackout, to subject the plant to that event and see its behavior.

COMMISSIONER OSTENDORFF: Can you briefly summarize the other test for station blackout? It's okay, come back to Marty, but -- I'd be interested in knowing in some detail what the test you're referring to are for station blackout purposes.

Eric, I have a question for you, on the cyber area. And over the last year or so there's been discussions with NERC and FERC, about the boundary

between the NRC and FERC/NERC with interface typically for nominal purposes of the switchyard interface and discussion about the bright line surveys and determining where that interface or handoff is between the NRC and other agencies. Are there any issues or concerns you have, with the proposed cyber plan as to that interface boundary between FERC/NERC responsibilities?

ERIC LEE: No sir. As you may be aware, the staff already -- SECY paper in response to Commission's SRM to associated with specifically addressing the issues to define what it means to be important to safety. And we have provided that information to the Vogtle and they have implemented their -- revised to reflect the changes into their Vogtle plan.

COMMISSIONER OSTENDORFF: Have there been any challenges or misuse of interpretation or application of that guidance?

ERIC LEE: Not that I'm aware of sir.

CRAIG ERLANGER: Sir, I'll just add that we continue to work with FERC and NERC and to date there have been no challenges and as Eric mentioned, as the author of the staff response in November, the applicant did supplement their cyber security plan on the docket to reflect the Commission's interpretation. So it's captured in a licensing action and we continue on a day to day basis to work NERC and FERC on implementation.

COMMISSIONER OSTENDORFF: Let me ask the applicant, are there any concerns in this area?

JERRY SIMS: No sir. We will include BOP critical systems and look at those CDAs that would be part of that interface. And if the interface moves, we'll move with it.

COMMISSIONER OSTENDORFF: Thank you. Thank you Mr. Chairman.

MALE SPEAKER: Are there other or comments on these sections?

CHAIRMAN JACZKO: I had one area that I wanted to briefly explore. The --this is not something we've talked a lot about, but it's similar context to the technical support center. One of the first votes, actually, the first one of, maybe the first vote I cast, probably the first substantive vote I cast as Commissioner was to approve the combined EOF for seven for Vogtle Farley and Hatch and one of the concerns I had at that time is whether that would really be a workable system. And coming out of that, one of comments that Southern made was to do a drill, a dual site drill once every five years. And I assume that decision was in 2005, one of the drills has been conducted.

THEODORE AMUNDSON: Yes, those drills have been conducted.

CHAIRMAN JACZKO: The question that I have is of course, one of the challenges we saw from Fukushima was the potential for multi-unit events. And if the Commission approves this license and you're successful and constructing plants at Vogtle, even at four units there, that would be a large site. So your EOF would be handling potentially large, potentially a large number of units at one time, up to potentially eight units. Have you considered, for the EOF, what the impacts would be on the EOF to handle a large number of events like that simultaneously?

THEODORE AMUNDSON: One of the things that we have done is look at the impact of adding two more units to the UF, Vogtle 3 and 4. And --

CHAIRMAN JACZKO: And when you say that, does that mean the impact of simultaneously having to deal with all of those units or --

THEODORE AMUNDSON: We already are in place, for an example, the tech--as I mentioned in my previous testimony, the technical support center is

designed to handle an event on one or all four units at the same time. The existing EOF is designed to handle an event at multiple sites and that would include two sites, two reactors at each site. So it's already designed to handle from four units.

Now we've been looking at it in terms of our planning for the EOF. If going to be adding two more sites, or two more reactors, one more site. And we have already looked at that and are planning and working that into our emergency planning procedures so that we will in fact be able to handle multiple units, multiple sites at one time.

CHAIRMAN JACZKO: Well that's good to hear, and I recognize at this point, there's not a clear regulatory basis for this but I think as we look at the Fukushima events, certainly one of the issues that I think we're going to have to address is somehow how we handle multiple unit events and so it's good to hear that this is something you're thinking about. And that if we do move in that direction, it sounds like you'll be prepared to handle that.

THEODORE AMUNDSON: We believe we will be. Yes.

CHAIRMAN JACZKO: Thank you. Any other questions? Okay, thank you. We will take a quick, take a five minute break.

(Whereupon, a short recess was taken)

CHAIRMAN JACZKO: That last panel concluded our safety focus panels for the hearing. We're now going to turn to the core environmental issues raised by the application. During this panel, we'll focus on the environmental impact statement including the staff's analysis and conclusions as well as the process by which the staff developed the EIS. This is an area where the staff works closely with governmental agencies at the federal, state, and local level

and with the public. Will all the panelists please state their names for the record and your title?

WHEREUPON,

ROBERT SCHAAF

MALLECIA SUTTON

GREGORY HATCHETT

were called as witnesses for the staff of the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:

ROBERT SCHAAF: Robert Schaaf, acting Director of the Division of Site, Environmental Review within the Office of New Reactors.

MALLECIA SUTTON: Mallecia Sutton, environmental project manager, [unintelligible] reduction.

GREGORY HATCHETT: Greg Hatchett, I'm chief of the branch, department of projects branch that led the review for this particular COL action.

CHAIRMAN JACZKO: We'll begin with the same way, with the applicant first for 15 minutes.

WHEREUPON,

DALE FULTON

AMY AUGHTMAN

CHUCK PIERCE

were called as witnesses for Southern Nuclear Operating Company and, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:

DALE FULTON: Dale Fulton, Nuclear Development Environment Project Manager for Southern Nuclear.

AMY AUGHTMAN: Amy Aughtman, AP1000, Licensing Supervisor.

CHUCK PIERCE: And I'm Chuck Pierce, the licensing manager for Southern Nuclear.

CHAIRMAN JACZKO: I'm sorry, if you all could slide one way or another. Thank you.

DALE FULTON: Again, my name is Dale Fulton, I'm the Nuclear Development, Environmental Project Manager. I'm responsible for the environmental licensing efforts and environmental activities associated with the construction of Vogtle Units 3 and 4. I'll be giving you a general overview of the environmental activities associated with the Vogtle 3 and 4 project that satisfies the National Environmental Policy Act or NEPA requirements. Next slide please.

The NEPA activities associated with the Vogtle 3 and 4 project covered the early site permit or ESP with the limited work authorization or LWA, and included three license amendments for the ESP, a combined license or COL that included an additional limit to work authorization request for our COL, environmental report, it referenced the ESP environmental impact statement that has finality. The process that governed the development of the COL environmental impact statement, referencing an ESP environmental impact statement is the new and significant process that provides a methodical, comprehensive review of the conclusions presented in the ESP environmental impact statement and the supporting information for those conclusions to identify any new and significant information that has the potential to change

the NRC's conclusions presented in the ESP environmental impact statement.

Due to the timing of the submittal of our combined license application, the environmental report was initially developed using the information identified during the new and significant process on the draft ESP environmental impact statement and was then revised to capture the conclusions made in the ESP final environmental impact statement. This new and significant process is procedurally controlled and the reviews will continue until the issuance of the COL. Next slide please.

The Vogtle 3 and 4 ESP application was unique in that it was the first application that did not follow the plant perimeter envelope and chose a specific design, the AP1000. The ESP environmental report included additional evaluations associated with items like need for power, cost, and site redress.

In addition, the ESP application included the environmental evaluations associated with the request for LWA to install engineered back fill, retaining walls, mud mats, water proof membrane and lean concrete fill. The staff issued the ESP final environmental impact statement in 2008 with no unresolved environmental issues. The impacts associated with the ESP ranged from small to moderate for construction, which includes impacts associated with site preparation, pre-construction, and the LWA activities. As for operations, the impacts ranged from small to large but I'll point out that the large impacts revolved around taxes and economy, which are beneficial, and therefore the adverse impacts are small.

Another aspect of the environmental activities associated with the ESP are the license amendments. These license amendments were granted, allowing Southern to use Category I and Category II backfill material from

additional on-site sources and to use engineered granular fill over the side slopes of the nuclear island excavation instead of Category I and II fill. Two of the three license amendment requests included an environmental report developed by Southern. License amendment I was for additional borrow sources in areas not included in the safety analysis, however were included in the ESP environmental impact statement. Since these areas are located in areas impacted by construction or for permanent facilities.

Amendment II was for additional borrow sources in areas not included in the safety analysis nor in the ESP environmental impact statement. The environmental impacts associated with license amendment II did result in a change in the ESP environmental impact statement conclusion with regard to terrestrial impacts, from small to moderate. During our environmental evaluations, triggered as part of the new and significant evaluations for our COL and ultimately used to develop the environmental reports for the license amendments identified the presence of two state listed threatened species, the southeastern pocket gopher and the sandhills milk vetch. Again, these are state threatened species and no regulatory requirement exists for protection. However, Southern initiated consultation with the Georgia Department of Natural Resources to conduct voluntary relocation to minimize the impacts of the two species. Prior to disturbing the area, Southern in conjunction with Georgia Department of Natural Resources and the University of Georgia, trapped and relocated southeastern pocket gophers to areas on site outside of the footprint of construction and in areas with better habitats for the species. As for the sandhills milk vetch, we worked with the Georgia Department of Natural Resources, the Georgia Plant Conservation Alliance and State Botanical Garden

of Georgia to also relocate this species to better habitat. Both voluntary efforts have resulted in continual collaboration with the mentioned groups to further research the species and refine conservation efforts.

The third amendment did not have an environmental consequence as it was an administrative change to allow engineered granular fill along the slopes of the nuclear island instead of the category I and II fill. The staff conducted environmental assessments for the three amendments and concluded a finding of no significant impact or FONSI, associated with the environmental impacts. Next slide please.

Now let's discuss the environmental activities associated with the COL application, which referenced the ESP environmental impact statement with the new and significant process being the primary driver to develop Southern's environment report and ultimately to staff's supplemental environmental impact statement. As mentioned before, due to the timing, the initial environmental report for COL was developed based on the conclusions in the draft ESP environmental impact statement and was later revised to capture the ESP final environmental impact statement. The COL application also included a request for additional limited work authorization activities where Southern developed a standalone environmental report for these activities in accordance with regulation.

Since the environmental impacts associated with the second LWA request were already evaluated and finality granted during the ESP, the standalone environmental report evaluated the ESP environmental impact statement conclusions and provided additional assurance that no additional impacts result from the limited work authorization activities. In addition,

the second limited work authorization conclusions from -- in addition to the second limited work authorizations, the conclusions from the three license amendments were incorporated in the COL supplemental environmental impact statement. The COL supplemental environmental impact statement was issued earlier this year with no open items. The environmental impacts concluded in the COL supplemental environmental impact statement were consistent with the conclusions in the ESP environmental impact statement with the exception of the change in terrestrial impacts from small to moderate, resulting from the license amendments.

However due to the environmental findings and voluntary mitigation efforts for the two state threatened species, the impacts will not destabilize terrestrial resources. Again, the COL supplemental environmental impact statement was issued with no open items. Next slide please.

Now I will discuss the new and significant review. But before I get into the general overview, I would like to take a moment to discuss Fukushima. Obviously the Fukushima event is the subject of a lot of discussion. While it was tragic and unexpected, the accidents comparable to the Fukushima accident, and severe accident mitigation design alternatives have already been considered during the NEPA review for the ESP environmental impact statement. Therefore there is no new and significant information.

Now the new and significant review. As previously mentioned, the process used to develop to the environmental report for the COL application and ultimately the staff's independent evaluation to develop the COL supplemental environmental impact statement referenced the ESP environmental impact statement, which is the new and significant process. For information to be

new, it must have not been considered in preparing the ESP environmental impact statement and not generally known or publicly available during the preparation of the ESP environmental impact statement. For new information to be significant, it must have a potential to materially affect the conclusions made in the ESP environmental impact statement. The staff audited Southern's new and significant process and found it acceptable. Southern concluded no new and significant information was identified during the period of time between the ESP and the COL. With that, I conclude my presentation on the NEPA process associated with the Vogtle 3 and 4 licensing activities. Thank you.

CHAIRMAN JACZKO: Thank you. Now I'll turn to the staff members' presentation.

WHEREUPON,

MALLECIA SUTTON

was called as a witness for the staff of the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, was examined and testified as follows:

MALLECIA SUTTON: Good morning Chairman and Commissioners. My name is Mallecia Sutton. And with me today is Gregory Hatchett and Robert Schaaf. I am the project manager that led environmental reviews for the Vogtle Units 3 and 4 combined license application. Today I will be presenting the staff's environmental review of the Vogtle application.

Before coming to work for the NRC, I worked with the U.S. Army Corps of Engineers. While working with the Corps of Engineers, as a technical biologist and project manager, I gained extensive hands on experience in environmental regulatory work including the purpose of documenting compliance

of the National Environmental Policy Act, NEPA, Endangered Species Act, National Historic Preservation Act and other regulatory compliance laws. I was responsible for preparation and review of technical environmental documentation such as environmental assessments and environmental impact statements. In presenting how the staff conducted environmental review I will focus on how we fulfilled the agency's publications under NEPA, as set forth in the agency's regulation 10 CFR Part 51. Consistent with the findings summarized in the staff's SECY information paper, this presentation will outline for the Commission the adequacy of the staff's review and why it supports the issuance of the requested combined license, and the limited work authorization. Next slide please.

This slide briefly describes the structure of today's presentation. The fact that the Vogtle COL application references an early site permit, also known as an ESP is central to understanding the staff's environmental review for the Vogtle COL. As documented in NUREG 1947, the final supplemental environmental impact statement for combined license for Vogtle electric generating plants Units 3 and 4.

The NRC's regulations require that for a COL application referencing an ESP, the staff is to prepare a supplement to the final environmental impact statement, or FEIS, prepared for the ESP. Accordingly, I will first explain the rule of the environmental ESP and FEIS for the COL review. I will describe the structure and key findings of the ESP and FEIS at the starting point for the development of the COL supplement.

Second, I will describe the process the staff used to prepare the supplement. This will include how the staff considered the applicant's process

for identifying new and significant information. I will also describe the staff's independent analyses and its interaction with the public and other agencies. Finally, I will summarize the staff's COL analysis and conclusions as documented in the supplemental EIS which I will refer to as today as SEIS. This will outline the staff's findings in the various resource areas covered by the review and provide examples of circumstances where the staff determined that additional analysis of new information was appropriate.

It will also explain why, with one exception, the staff found that its ESP stage conclusions were not affected by new information. As part of this discussion, I will explain in more detail, the one resource area where the staff's conclusion did change. In doing so, I will highlight how the staff accounted for the novel situation of Southern's requests for amendments to its ESP limited work authorization which was submitted during the COL review. Next slide please.

As described previously, the COL application references Vogtle Early Site permit and limited work authorization which was issued to Southern in August 2009. Title 10 of the Code of Federal Regulations CFR 51.75 requires that if the COL application references an ESP, then the NRC staff shall prepare a supplement to the ESP, EIS, in accordance with 10 CFR 51.92(e). Because an ESP requires an environmental impact statement that considers the impact of all, of both construction and operation of a reactor, or reactors, at a selected sited, the regulations enable the COL review to take advantage of the substantial resolution of issues that occurs at the ESP stage.

Accordingly, the regulations in 51.92 direct the COL review to address unresolved issues, if any, that may remain from the ESP stage and to

otherwise focus and whether there is new and significant information with respect to issues that were resolved.

The regulations also directly preclude the staff from revisiting certain issues from the ESP that have finality. Most importantly because the suitability of the site is the central determination made in an ESP, the COL supplement is not permitted to discuss any alternative sites. While alternative sites were required to be examined in the ESP and SEIS, they are not reconsidered at the COL stage. The NRC's regulations require the staff to take the ESP and FEIS as a starting point in order to -- appropriately focus on COL review.

The Vogtle COL application is not the first to be submitted to the NRC that references an ESP. However there are several features of the Vogtle ESP that distinguishes it from other ESPs that the agency had issued, as will become clear during my presentation. These differences resulted in important efficiencies in the review. Next slide please.

Consistent with the reviews of other ESPs. The Vogtle ESP, following the environment impact statement addressed potential impacts from construction and operation of new units in a wide range of relevant resource areas. These areas are shown in this figure. The areas include land use, meteorological and air quality, water use and quality, ecology, socioeconomics, historical and cultural resources, and environmental justice. They also include impacts in non-radiological and radiological health, impacts of postulated accidents and fuel cycle and the cumulative effects from past, present, and reasonably foreseeable future actions. As required by NEPA, the ESP also considers viable alternatives including alternative sites. Next slide

please.

However, the Vogtle ESP applicant chose to address certain topics that under NRC regulations are optional for the ESP stage. An ESP applicant can decide to defer consideration of need for power or energy alternatives through the COL stage.

Because the Vogtle applicant addressed these subjects in its ESP application, the staff evaluated them in its Final Environmental Impact statement. And these issues were therefore resolved at the ESP stage.

Another unique feature at the Vogtle ESP application is that it was the first ESP not to the use the Plant Parameter Envelope approach. That is, instead of basing its Environmental Impact Evaluation on a combination of representative parameters from a range of potential reactor design, the applicant based its evaluation on parameters of a single reactor design, the Westinghouse AP1000. Which the NRC had already certified. This avoided the need to consider impacts that might be associated with less well known designs. Also Southern anticipated that its COL application would reference the amended AP1000 design.

Using the parameters of the AP1000 certified design further minimized the likelihood that there would be environmentally significant differences between the basis for the ESP analysis and the design ultimately selected for the COL. For all these reasons the ESP FEIS had no unsolved issues.

Another important feature of the Vogtle environmental review is how closely in time to the ESP the COL application was submitted. Under NRC regulations the ESPs are valid for up to 20 years. That means that a COL

applicant may reference an ESP whose EIS had been prepared more than two decades earlier. However, the Vogtle COL application was submitted in March 2008. While the Vogtle ESP review was still underway and the FEIS was not yet issued. By minimizing the time gap between its applications, Southern further decreased the practical likelihood that there will be extensive new information to be addressed in the COL.

In sum, because the Vogtle ESP not only took advantage of the early resolution of issues anticipated by Part 52, but also coordinated the timing of its ESP and COL applications the ability to tier off the ESP final environmental impact statement resulted in a streamlined and more focused COL supplement.

Furthermore, the COL environmental team was able to complete its efforts in approximately 18 months. Next slide please.

For all the reasons just discussed, the ESP and FEIS was the key starting point for the development of the COL SEIS. I will now briefly summarize the conclusions in the ESP FEIS NUREG 1872. Because the SEIS tiered off the ESP final environmental impact statement, it closely followed the structure of that document. The ESP conclusions were reached using the significance level definitions of small, moderate, and large impacts. These definitions are based on guidance developed by the Counsel of Environmental Quality. They consider the environmental effects are detectable and, if so, whether they are significant to noticeably alter or to destablize important attributes of that resource.

The staff found that ESP EIS with a few exceptions most of the environmental impacts of construction and operations to the two new units at

the Vogtle site would be small. In three resource areas land use, ecology, and socioeconomics, the staff determined that the impact would be small to moderate. In one area historic and cultural resources the staff found that impacts would be moderate. For many resource areas the EIS analysis explains why impacts would only be temporary or would be mitigated. Next slide please.

As I just mentioned, most impacts of the new units were determined to be small. This was the staff's conclusion in the areas of air quality, water use and quality, environmental justice, health, radiological and non-radiological, and from postulated accidents and fuel cycle. For example, with respect to water use and quality, the staff determined that the plant would use only a very small proportion of the water in the Savannah River at the plant location that impacts such as the construction of intake and discharged structure and the thermal effects of the discharge plume would be localized and temporary, and the licensee's compliance with federal and state required permits and certifications would minimize any impacts. Next slide please.

In a few resource areas the staff determined that ESP -- the impacts will be small to moderate. For example, the staff found that impacts to terrestrial ecology resource would be small to moderate. The staff's conclusion of generally small terrestrial ecology impacts was based on factors including the applicant's best management practice of interaction with the State of Georgia Department of Natural Resource. However, the staff concluded that depending on the final transmission line route, terrestrial ecology impacts within the right-of-way could be moderate.

As another example, the staff determined that impacts of socio-economics resource would be mostly small. It found that in a few sub-

categories impacts would be moderate and adverse, especially to Burke County where the plant is located. And that in certain sub-categories like property tax revenues, impacts would be moderate and beneficial. The staff found that impacts of infrastructure and community service would be small, but aesthetic impacts along the transmission line route would be moderate as could traffic impacts on roads in the site vicinity during construction. The effect on tax revenues would be beneficial and small, except for property tax receipts in Burke County would be beneficial and moderate.

Finally, the staff determined that impacts to historical and cultural resources would be moderate based on the adverse effect of construction activities near recognized historical sites and the likelihood of inadvertent discoveries of agricultural deposits during construction activities. As explained in the ESP, these impacts were considered in with consultation with Georgia's state historic preservation officer and mitigation measures were identified to minimize those impacts. Next slide please.

As previously mentioned, the ESP FEIS also evaluated the need of power as well as alternatives to the proposed action. The staff agreed that the applicant has demonstrated the need for the base load power that would be produced by two new units at the site. The staff also found that there were no environmentally preferable alternatives. The staff also examined several alternative sites and concluded that there was no environmentally preferable site and thus that there was no obviously superior site. The staff also found that after considering environmental costs and benefits of the proposed action, primary the demonstrated need for power, the analysis supported issuance of the ESP. As I explained previously, the ESP FEIS had no unresolved issues. As a

result, the SEIS review followed the structure of the ESP FEIS, but with the review process focused on new and significant information. Next slide please.

In the next two slides, I will be discussing the staff's environmental review process for the COL application I led. To complete an agency's environmental review of the COL application a multi-disciplinary team of NRC staff and contractors from Pacific Northwest National Laboratory or PNNL. This team was comprised of more than 25 members with backgrounds in particular technical and scientific disciplines required to perform the environmental review. The team members are identified in Appendix A of the Supplemental Environmental Impact Statement. The team members also had experience with other NRC environmental reviews and PNNL has supported NRC in preparing the EIS for previous NRC licensing actions, such as those prepared for the ESPs and COLs. Furthermore, most of the team members were also on the ESP team are able to leverage this experience for the COL review. Next slide please.

Pursuant to 10 CFR 51.92 the staff's COL environmental review focused on whether there was new and significant information. As previously discussed, the NRC is required to prepare a supplemental environmental impact statement as part of its review of a COL application referencing an ESP. The NRC staff tiers off the ESP EIS at the COL stage and discloses the NRC conclusion for matters resolved in the ESP review. Detailed procedures for conducting the environmental portion of the review are found in NUREG-1555, the Environmental Standard Review Plan, or ESRP, which is the Staff's principal guidance document for conducting environmental reviews.

As I will explain, the staff's review drew on staff guidance,

information gathered during several site audits, the staff's evaluation of the applicant's process for identifying new and significant information obtained by the applicant through requests for additional information, interactions with the public and with other governmental agencies, and the staff's independent analysis.

Let me begin by describing what is meant by new and significant information. The introduction of the ESRP was revised and issued for use and comment in 2007 to be consistent with 2007 amendments to the rules of licenses, certifications, and approvals for nuclear power plants. This document included guidance for COL application referencing an ESP and aids the staff to determine whether or not information is new and if so whether new information is significant.

For information to be new, in the phrase, "new and significant," it must – it is defined as information that was first not considered in preparing the ESP ER or EIS. Second, not generally known but probably available during the preparations of the ESP EIS. For information to be significant it must be material to the issue being considered. That is, it must have the potential to affect the staff's findings or conclusion from the ESP FEIS. The staff is ultimately responsible for determining the significance of new information.

In addition to the information provided or made available by the applicant, the staff may develop independent sources to inform its conclusions. The ESRP guides the staff in methods to become aware of new information and provide several examples that could be considered by the staff as well as the applicant. These include methods such as considering environmental monitoring results, scientific literature, and surveying environmental professionals

familiar with the site vicinity. The staff methods all seem to verify that the assumptions and representations made in the ESP ER and ESP EIS are still valid.

Consistent with the ESRP guidance the staff's new and significant review process for the Vogtle COL review consisted of several activities, including appropriate site audits. The site audits are used for evaluating for the applicants process and for gathering information for staff's independent evaluation. As required by 10 CFR 51.50(c)(1), a COL applicant referencing an early site permit is to establish a process to identify new and significant information.

Because the Vogtle applicant tendered its COL application while the ESP application was still pending, the staff site audit conducted early in its COL environmental review process, was focused on determining whether the COL applicant's process used a reasonable methodology to identify new and significant information. The audit on the applicant's process was conducted in August 2008 and documented in the audit report. Because the applicant's presentation has a -- excuse me -- I will now -- however, the process -- however, the applicant process is summarized in the SEIS, and I will not go into it today.

Subsequent to the issuance of the ESP and the accounting LWA the staff conducted another audit in September 2009 to determine if Southern followed its new and significant information process. However, any new and potential significant information was identified that could affect the evaluation performed and resolved in the ESP.

The site audits also included several site tours, including a tour of the potential transmission line rights-of-way, and the location of the

intake structure on the Savannah River, and the locations of cultural and historic resources.

The Staff also conducted a separate environmental audit associated with the applicant's requests to amend its ESP and LWA in May 2010, which included use of additional fill material from borrow areas that were not considered in the ESP FEIS. These requests were ultimately addressed in three separate amendments to the ESP and LWA, and for which the staff prepared Environmental Assessments.

However, the staff appropriately accounted for these -- for those developments including informational change to the site audits in its SEIS for the COL environmental review. Based on the staff's independent review of the applicant's new and significant information process, including the verification that the applicant did follow its process, concerning environmental issues addressed in the ESP EIS, the staff found the process to be adequate. Next slide please.

At the completion of the site audit, the staff identified areas where additional information was needed to complete this review and submitted requests for additional information to the applicant. The staff also conducted its own independent search for new and significant information concerning issues resolved in the ESP EIS and then determined whether or not that information had the potential to change the impact level assigned to a particular resource.

The process included but was not limited to contacting applicable federal, state, tribal, and local agencies. In particular the staff contacted the State of Georgia Historic Preservation Officer (SHPO), Georgia Department

of Natural Resources, South Carolina Department of Natural Resources, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, National Marine Fisheries and approximately 30 Federally-recognized Indian Tribes in order to gather relevant information.

As an example, the staff received a response letter from the Fish and Wildlife Service indicating that the listed threatened or endangered species under that agency's purview had been adequately addressed. The staff had a public comment meeting on October 7, 2010 and collected comments on the draft SEIS. The staff's consideration of comments are included in Appendix E of the Supplemental Environmental Impact Statement. The staff used the results from these processes to analyze all resolved issues from the ESP EIS in order to meet the requirements set forth in 10 CFR 51.92(e). The staff also kept aware of developments in the NRC staff's parellel safety review of the COL application to the extent they might be relevant to the environmental review. This included considering changes associated with revisions to the reference AP1000 design control document, or DCD. The staff determined that none of the changes between the revisions to the DCD had the potential to change its impact conclusions in the FEIS or SEIS. Next slide please.

In order to facilitate the effective tiering off of the FEIS, the supplemental environmental impact state is organized with exactly the same structure, as the Early Site Permit final EIS. The staff searched for and evaluated new information in each Chapter. When the staff identified new information that warranted further analysis it described that new information in the SEIS and explained whether it resulted in any change in the staff's ESP stage conclusion. As explained in the supplemental environmental impact

statement, with exception of terrestrial, the impacts level in the SEIS did not change from the ESP at FEIS. Next slide please.

Now I will discuss some examples of where the staff identified new information warranting further analysis and how the staff analyzed that information. With respect to land use, there was a change in affected acreage. The development of site would require additional 379 acres for the fire training facility and the simulator building, in addition to another 900 -- 494 acres that will be temporarily impacted for obtaining backfill. This did not change the land use impact level from the ESP EIS, given that the new acreage is already on the Vogtle site, which is zoned commercial and the intended use of new disturbed acreage matches the use described in Burke County comprehensive plan. With respect to meteorology and air quality, the staff considered information from a 2009 traffic study that made some changes in assumptions about construction worker shifts and site workforce and provided a refined estimate of vehicle emissions.

The staff also found that EPA had issued a new standard for ozone in the national ambient air quality standards. However, because the results of the traffic study remained consistent with the staff's ESP stage analysis, and because Burke County continues to be in attainment for the National Ambient Air Quality standards, even under the revised ozone standard, the assessment of small air quality impacts remained the same.

The staff also assessed new information related to surface water and ground water impacts. The applicants submitted new information on the proposed intake structure design. However, the staff determined that these changes did not significantly modify the width of the intake canal or the

length of the canal extending beyond the existing river bank. Consequently, the hydrological alterations resulting from construction activities would thus remain localized and temporary as concluded in the ESP FEIS. The applicant also provided new information regarding additional on site borrow areas, from which it sought to obtain backfill material, including three new borrow areas. I will discuss this topic in more detail later in my presentation, regarding its effect on the staff's terrestrial ecology analysis. However, with respect to water-related impacts, the staff found that these borrow areas are included in the applicant's national pollutant discharge elimination system permit for construction stone mortar and that the excavations would neither intersect the water table nor require dewatering. The staff therefore concluded that with respect to surface water and ground water that the ESP EIS conclusion remains valid for excavations from new borrow areas.

Also, with respect to water quality impacts, the staff identified new information that warranted further analysis regarding the total effluent discharge to the Savannah River, namely, an increase of three percent in the discharge rate. The ESP EIS thermal plume analysis which used the CORMIX model, made a number of conservative assumptions. Nevertheless, the staff wanted to verify its assessment in the ESP FEIS of small impacts would remain valid. Accordingly, the staff re-ran the CORMIX model with the three percent higher discharge rate. Because the size of the thermal plume did not significantly change, the staff determined that the impact level would not change. Next slide please.

The staff found new information in both aquatic and terrestrial ecology resources that warranted further analysis. The staff did determine

that the information in the area of terrestrial ecology was new and significant. I will discuss this in more detail in my upcoming slides. With respect to aquatic ecology, the staff determined that October 2010 the National Marine Fisheries Service had developed a proposed rule listing for the Carolina and South Atlantic distinct population segment of the Atlantic sturgeon, as endangered on the Endangered Species Act. In the ESP review the NRC staff determined that an impact to Atlantic sturgeon would be small. The staff determined that the project has not been modified in any way that would cause an effect to the Atlantic sturgeon, not previously considered in this ESP. Nevertheless, because of the listing proposal, the staff compiled information in a conference consultation letter to National Marine Fisheries. None of the information compiled by the staff for the Atlantic sturgeon resulted in a change to the ESP conclusion because none of the contemplated shoreline construction activities will prevent the Atlantic sturgeon from migrating past the site. National Marine Fisheries responded and agreed with the staff's views on impacts to Atlantic sturgeon. Also in connection with aquatic impacts, the applicant confirmed during the COL that it had received this required certification on this section 401 of the Clean Water Act from Georgia Department Natural Resource in June of 2010. It also received a Clean Water Act section 404, Rivers and Harbors Act section permit from the Army Corps of Engineers in September 2010.

The Corps permits confirmed impacts and mitigation measures such as pressures of stream mitigation credits consistent with those analyzed in the staff's ESP EIS. This continued to support the staff's conclusion of small impacts to the aquatic resource from both construction and operation of the new

units. Regarding historic and cultural resource the new areas for the ESP amendments were identified in the existing area of potential effects. The area of potential effects had been surveyed for cultural resource at the ESP stage and potential culture resources in those areas had been determined not to be significant. The Georgia SHPO concurred with this finding.

Also during the COL audits the staff identified a newly fenced area that contained a historic cemetery. The cemetery was located outside of the direct impact area that was fenced in order to protect it. The applicants signed a memorandum of understanding with Georgia SHPO to ensure the site is properly preserved. These actions further indicate that applicant will protect historical and cultural resource on the Vogtle site or mitigate impacts with consultation with the Georgia SHPO. The staff concluded that the conclusion in the ESP EIS of moderate impacts remained valid in the FSEIS. Next slide please.

In the need for power review, Georgia Public Service Commission certification was issued in June of 2010. This certification supported that staff's conclusion regarding the need for power in the ESP, confirmed the need for additional base load generation in the region of interest. As required by 10 CFR 51.92, further consideration of alternative site is precluded at the COL stage. However, other aspects of the ESP alternative analysis remain subject to review for new and significant information during the COL review.

For example, regarding energy alternatives, the staff determined that Georgia Power Company expects to achieve 900 megawatts electric demand reduction by 2013 through demand site management, which would represent more than five percent of Georgia Power Company current load. However, the staff

verified the 900 megawatt electric is already accounted for in the Georgia Power Company integrated resource plan and thus not available to offset the need for the two new units as determined by Georgia Public Service Commission.

Also the staff confirmed that applicant has no plans to reactivate any retired power plants in this region of interest. The staff also discussed EPA's tailoring rule, which would regulate new source pollutants under the Clean Air Act. The staff considered that the rule might reduce emissions to fossil fuel energy alternatives and emissions associated with nuclear fuel cycle. However, the staff determined that even without considering the potential effects on emissions associated with nuclear fuel cycle, any changes as a result of the rule would not reduce emissions in such a way as to change the relationship between the potentially viable energy alternatives that have been analyzed in the ESP. For these reasons, none of this new information changed the staff's analysis of alternatives in such a way that it would make those alternatives environmentally preferable to the proposed action as described in the ESP. Next slide please.

In October 2009, the applicants submitted an application for a second limited work authorization or LWA. The second LWA, in accordance with 10 CFR 50.10(d), would authorize insulation of reinforcing steel, sumps, drain lines and other embedded items along with placement of concrete on the nuclear island foundation base lab. In Chapter 4 of the ESP EIS the staff had already evaluated construction impacts associated with these activities because they had originally been within the scope of the ESP stage LWA request, but were later withdrawn. As explained in the ESP EIS, the impacts associated with LWA activities would only be a small portion of overall construction impacts and

therefore be small. The SEIS referenced this previous analysis in the ESP and accordingly found that the impacts associated with the second LWA are already bounded by the analysis and conclusions in the ESP FEIS would remain small. The staff also verified the site redress plan discussed in the ESP EIS would adequately redress the impact of the activities requested under the second LWA. In the event construction is terminated, the COL application is withdrawn or denied or the LWA is revoked.

As a result, the staff's conclusion that an LWA activities submitted would not result in any significant adverse environmental impacts that would not be redressed is bounding and valid. In sum, the SEIS drawing on the ESP FEIS has analyzed the impacts of the LWAs as well as the full range of construction operation impacts associated with the COLs. The staff review in the SEIS accordingly supports issuance of both COLs and LWAs. Next slide please.

In April 2010, Southern submitted to a license amendment request or LAR to amend the ESP Site Safety Analysis Report to obtain and install backfill materials from additional on site borrow locations. In May 2010, Southern also submitted an LAR seeking to change a past location of backfill over the slopes of Units 3 and 4 excavations, which would decrease the total amount of qualified backfill needed. As a result, while the staff performed an environmental review for the ESP amendment the applicants need to obtain the backfill materials from additional on site sources was also considered as new and potentially significant information with respect to the COL environmental review.

The staff proceeded to prepare three environmental assessments for

the LARs; the first addressed the request to obtain backfill from on site borrow areas and areas whose disturbance had already been addressed in the ESP EIS. The second addressed a request for borrow sources in previously undisturbed areas that were not previously evaluated in the ESP EIS. The third addressed the applicant's proposal to change the classification of the backfill. In each case the staff reached a finding of no significant impact for proposed actions. Consistent with NEPA and minimized duplication of effort the staff discussed the three ESP amendments in the COL FSEIS and incorporated the description analysis in the second environmental assessment by reference.

The impacts discussed in the first and third environmental assessments were already fully addressed by the analysis in the ESP EIS. However, the use of additional on-site borrow areas resulted in some impacts outside the footprint previously analyzed, in particular with respect to sandhills milkvetch, a Georgia-state listed threatened plant species and the South Eastern Pocket Gopher in Georgia's state listed mammal. The staff determined that this information would result in a change in the construction impact level for terrestrial ecology from small in the ESP EIS to moderate, in the COL FSEIS. The impact level resulted from the use of additional on-site borrow areas not previously evaluated in the ESP EIS and the subsequent loss of Sandhill's habitat and displacement of localized populations of Southeastern Pocket Gopher and the sandhills milkvetch species which are indicative of the Sandhill's habitat.

ROBERT SCHAAF: If we can just beg the Commission’s indulgence, we’re getting to the finish line.

CHAIRMAN JACZKO: That’s fine.

MALLECIA SUTTON: Thank you. Southern has voluntarily mitigated impacts to both species via relocation efforts to suitable habitats on site that would not be disturbed during the construction. So it has also committed, if possible, to replant longleaf pine, a fundamental component of sandhills habitat, in the borrow areas that were disturbed.

The staff concluded that the site preparation and construction activities related to obtaining backfill from additional on-site borrow areas could noticeably alter terrestrial resource to the loss of Sandhill's habitat and displacement of localized populations of the Southeastern Pocket Gopher and the sandhills milkvetch, but would not have a destabilizing effect on either habitat or the populations of those species in Georgia. Consistent with NEPA and to minimize duplication of effort, the staff discussed the three ESP amendments in the COL FSEIS and incorporated the description and analysis in the second environmental assessment by reference. Next slide please.

In summary, subsequent issuance of the ESP, the staff concluded that the applicant's process to identify new and significant information was adequate for the purpose of meeting the requirements of Part 51. It conformed to the guidance outlined in regulatory guide 1.206. This conclusion was based on the staff's audit of the process and its independent evaluation including independently developed sources. Consequently, the staff has high confidence in the reliability of the information that it used to analyze the issues that would be affected by new and significant information. The NRC staff found that land-disturbing activities associated with the request for a license amendment to acquire additional backfill changed one conclusion from the ESP FEIS, namely, the area of terrestrial ecology impacts, but did not otherwise alter

the ESP stage conclusions.

The NRC staff took comprehensive measures to become aware of the new information during the Vogtle environmental review process, including the opportunity for the public to raise comments on the draft SEIS and has confidence that it adequately considered the significance of source information. The staff's review approach was consistent with NRC applicable staff guidance, realized the benefits of referencing in recent and thorough ESP, and was performed by an experienced multidisciplinary team. The ESP and COL licensing actions and the aforementioned ESP amendments were coordinated and staged effectively to ensure that the work of the staff was performed efficiently and conformed to NRC's regulations by implementing NEPA. This concludes my presentation, thank you.

CHAIRMAN JACZKO: Well thank you. We'll turn now to questions. How often do we have anything other than small impacts in EISs, is that typical or atypical? Can you give me a sense?

GREGORY HATCHETT: Just more recently -- and some of the other ones, this summer -- FEIS was published back in April of this year and they had some moderate impact related to EJ. So, I mean, we do get them from time to time but usually they're in the small range.

CHAIRMAN JACZKO: And then at what point, just kind of a mitigation will kick in, do moderate impacts require some kind of a mitigation strategy, is it large impacts that do, or how does that work?

GREGORY HATCHETT: Just as a matter of practice or process the applicant, in their ER, provides for the staff review, measures and controls that they would implement to mitigate the impact of their action and some of

those things are within the Commission's purview and some of those things are outside of the Commission's purview.

CHAIRMAN JACZKO: So if you take this moderate impact for the terrestrial ecology, are there, either through state or federal agencies, are there requirements for specific mitigating measures to address that?

MALLECIA SUTTON: Yes, there's state permits that the applicant must follow, that mitigates those impacts.

CHAIRMAN JACZKO: So is it moderate after the mitigation or before the mitigation?

GREGORY HATCHETT: With respect to the specific question on the terrestrial ecology, we'll note that there are no specific requirements for mitigation on private land, and as the applicant indicated in their presentation, they voluntarily did the mitigation, working with the state and the other agencies and we physically were out there when they were doing some of the trapping of the Pocket Gopher. Having said that, we look at the staff's definitions and its regulations of small, moderate, large. We used that process because we went from the ESP of no impact to the Pocket Gopher, to a noticeable impact to the Pocket Gopher and we made the requisite change.

CHAIRMAN JACZKO: Okay. So at this point there is no relevant state or local requirement that anything be done to address, okay. Mr. Fulton, I had a question for you, you mentioned with regard to Fukushima, the bounding of the Fukushima accident, can you provide whatever technical analysis you have to support that statement?

DALE FULTON: Essentially what we considered was the Fukushima event and the consequences associated with that event and not necessarily the

initiating event.

CHAIRMAN JACKZKO: As you can just provide us with whatever analysis you have.

DALE FULTON: What we do is a screening. In our new and significant process, we do a screening to determine if it's new and significant. There was not --

CHAIRMAN JACZKO: Again, if you could just provide whatever analysis you have, if you can just provide that. Thanks.

Turning back to this issue with the staff as well. We have -- as to my recollection was that the EIS had come out a little bit later in than it did, I think the date on it is March, by the time it goes to the printer and all that, probably finished working on it sometime in February, and so obviously Fukushima happened sometime after the current final EIS was done. One of the things that was done -- and I'm not an expert in our severe accident analysis that we do in the EISs, but one of the things that I would think would be a little bit different, I think that we've learned from Fukushima is that maybe to consider in a way that we haven't, multi-unit events and the potential impact that that may have. So, I'm wondering if you can give me a sense if that's something we've looked at, at this point or not.

GREGORY HATCHETT: Chairman, I think those issues are currently under consideration as part of the task force recommendation and --

CHAIRMAN JACZKO: Which issues?

GREGORY HATCHETT: The issues of multi units events or station blackouts, all the kinds of things that the lessons that we're learning about the Fukushima event, what we principally focused on was first, any new any

significant information that we may have found with respect to the original environmental analysis for severe accidents and that was done, published in the same month that the event occurred,

CHAIRMAN JACZKO: So that analysis was done before --

GREGORY HATCHETT: But we didn't find anything, so then the next step was the task force report came out, we looked to it, they essentially documented that a Fukushima-like event was not likely in the U.S., but then more importantly, we're looking at the Vogtle application and the Vogtle-specific concerns related to an AP1000 plant and the ability of that plant to withstand certain external events and obviously no one here at this table, the staff part, are experts in severe accidents either, but we're looking to that information.

CHAIRMAN JACZKO: So when we do the severe accident analysis, do we assume that the severe accidents happen?

GREGORY HATCHETT: Do we assume that these happen?

CHAIRMAN JACZKO: I mean we do a severe accident analysis so we assume a severe accident.

GREGORY HATCHETT: Yes, we do assume the accident --

CHAIRMAN JACZKO: And then when we do that analysis, do we assume, let's take specifically the AP1000, did we consider more than one unit at a time having a severe accident?

GREGORY HATCHETT: With respect to what we're doing in looking for new and significant information --

CHAIRMAN JACZKO: No, I'm talking about the analysis that was done.

GREGORY HATCHETT: I can't answer the question about the analysis,

we can get back to you about that.

CHAIRMAN JACZKO: Can you --

GREGORY HATCHETT: From a safety side perspective --

CHAIRMAN JACZKO: No, I mean from the severe accident analysis that was done in the EIS.

GREGORY HATCHETT: What we do with the EIS, we look at what's done at the safety side and make sure we are consistent with what we are looking at in terms of accidents, whether they're design basis accidents or severe accidents. And what I said yesterday, with respect to that --

CHAIRMAN JACZKO: I mean -- we have a methodology for a severe accident analysis that we do for EIS, is that not true?

ROBERT SCHAAF: In the environmental reviews?

CHAIRMAN JACZKO: Yeah.

ROBERT SCHAAF: Yes, yes.

CHAIRMAN JACZKO: So the licensee submits that, or we do that?

MALLECIA SUTTON: The information is submitted to the staff and the staff then evaluates that information.

CHAIRMAN JACZKO: Okay, so the information that was submitted as part of the early site -- I mean we go back to the early site permit. Did we consider the severe accident involving more than one reactor simultaneously or with some time lag or something like that?

DALE FULTON: Mr. Chairman, can I help answer that?

CHAIRMAN JACZKO: Sure.

DALE FULTON: Our severe accident analysis, I'm not a severe accident expert, but in our ESP environmental report, we consider the dose

released to the public for a event of -- taking into account not only our Vogtle three and four, also one and two.

CHAIRMAN JACZKO: So simultaneously?

DALE FULTON: Simultaneously.

CHAIRMAN JACZKO: All four? Okay. So that's the reason why it's bounding.

DALE FULTON: I would tend to agree with that, yes.

CHAIRMAN JACZKO: Okay, thank you. When the staff looks at these kinds of things -- so there's the issue of whether there's new and significant information, then to what extent do we document that, to what extent do we put in the EIS, a statement that says, as Mr. Fulton indicated, we previously analyzed this and based on what we previously analyzed this accident is bounding? Is there an extent to which -- does that require then a complete supplementing of the EIS in order to conclude something like that or can that be done, I guess, through the hearing process I suppose.

GREGORY HATCHETT: The answer to that question would be, yes, with some clarification. Yes, if we found a need to do a supplement, we would have done that. And we didn't find a need to do a supplement in this case. And yes, if the record of decision of the hearing. The hearing basically serves as the record of decision for the EIS, and so it could be documented as part of the hearing as well. Thank you.

CHAIRMAN JACZKO: Commissioner Svinicki?

COMMISSIONER SVINICKI: Well thank you for your presentations. The staff talked occasionally about site audits that the staff conducted and it seems to me from the instances where that was mentioned, occasionally that

might take the form of maybe a desktop audit, how did the applicant look for new information and then how did they assess whether or not it was significant. But, Greg, you just mentioned that you also observed some trapping of species and relocation. Can you very broadly describe to me the types of site audits and other activities that were conducted by the staff? And you made some reference to these, and I think some would take the form of paperwork, but some, it sounds like, involved field work. Could you just elaborate on that?

MALLECIA SUTTON: Yes I can. The staff audit is a very important part of reviewing the applicant new and significant process. The staff looked at a range of resource areas and determined if there's new information -- if the information was represented in a category of significance or whether it was significant or not, because that is a staff determination.

COMMISSIONER SVINICKI: Would you also look at how thoroughly they looked for new information? I think you made reference to, they could do literature searches and other things. Do you have a way of auditing how hard they looked?

MALLECIA SUTTON: What we do when we look at that information, we also, the staff also verifies the information by contacting other things, federal agencies and things, contact information to verify the information is reliable for the staff's review.

COMMISSIONER SVINICKI: Okay, and then in terms of any auditing of actual field data or things like that, was this observation of the species relocation just more informational or was that actually an auditing activity or some sort of surveillance?

MALLECIA SUTTON: When the applicant submitted the license

amendment for the ESP on the docket, what we did was went ahead and did a second site audit to verify the information we received in a licensed amendment request, in June the site we also had Georgia Department of Natural Resources that came out. We actually walked the site, we were able to see the relocation efforts from, for the Pocket Gopher and the location efforts for the sandhills milkvetch.

COMMISSIONER SVINICKI: Thank you. I believe that the COL supplement EIS assessed that changes between revisions 15 and 17 of the AP1000 design control document were not significant for purposes of environmental review. Was there an assessment that would have looked at changes between revisions 17 and 19?

MALLECIA SUTTON: As I mentioned earlier, the staff looked at revision, all of the revisions, and revision 19 was more correction-based; there was nothing that linked it back to the environmental review analysis. And there was nothing that changed from the original revision 17 to 18 that changed our analysis from the ESP EIS. So, we kept close contact with our safety counterpart to ensure that was the case.

COMMISSIONER SVINICKI: And you have mentioned, again I think this is more of a programmatic assessment really than something for the regulatory findings at issue here, but you did mention a couple of times in your presentation about having the benefit of the fact that the COL application followed on so closely in time after the ESP, even I think you mentioned, in terms of PNNL expert support that the team benefitted from having some of the same individuals that had worked or looked at the ESP EIS for this. By that do you indicate or do you think that it's fair to conclude that if a COL

application did not follow on so quickly in time after an ESP, you mentioned the 20 year period in which it would be referenced. Do you think that if the Commission were to assess how it went in terms of the staff resourcing and the amount of time and effort they had to put into for the global COL supplement EIS, that that may not be a good indicator or model of how this would go in the future in terms of the amount of effort involved, if indeed an ESP were invoked much later than it was granted?

MALLECIA SUTTON: I think we have to keep in mind that Vogtle was unique, that it resolved all issues, there was no deferred issues to the COL supplement. And leveraging the staff that worked on the ESP EIS was very fundamental in looking for areas where there was new information to see if it was significant, so I don't want to -- when I look at the Part 52, I mean, Vogtle, I don't want to say this but might be the closest reference to probably what the Part 52 application might look like. So, it's, like I said – but there is – the areas of – using – not using a plant parameter envelope as well, was also a unique feature. So, there was a lot of different features that Vogtle did that was different from the other ESP EIS's that we benefited from in this review.

COMMISSIONER SVINICKI: And I think all I'm concluding is because you're emphasizing some of that uniqueness and saying in some instances it was a benefit to the staff's effort, it may be that not all experiences would be the same -- not be the model for how they all would --

GREGORY HATCHETT: No, what I would add is this that is probably the closest that we've seen to date that's how the Part 52 process is intended to work, particularly on the environmental side, because of the way the

applicant approached the process.

COMMISSIONER SVINICKI: Thank you. Robert, did you want to add anything? Okay, all right, thank you, Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Apostolakis?

COMMISSIONER APOSTOLAKIS: First of all, you mentioned, Mr. Fulton, that you considered an accident from all four units in the release of radioactivity. Did you do that because of Fukushima, or is it something that is expected to be done in an environmental review of sites?

DALE FULTON: Yes, that was part of our original environmental impact statements for the ESP.

COMMISSIONER APOSTOLAKIS: Because that's what we've been doing for decades now? We consider multi-units? In the original environmental statement for Vogtle, the two units, would they consider the simultaneous accident of both, or is it more recent?

DALE FULTON: I couldn’t answer that.

COMMISSIONER APOSTOLAKIS: Okay. Another one, another question that, maybe it's because I don't understand how these things work but you said that you found small to moderate impacts for land use. And does this include accidents? That would be a moderate impact on land use if there is an accident? Particularly Fukushima, it seems to me, the major impact has been land contamination. So, is that a moderate thing what happened at Fukushima?

GREGORY HATCHETT: With respect to what the staff analyzed, the land-use impact that we're talking about primarily has to do with the actual land disturbance there. And then with respect to the radiological impacts, that's actually in the other section of the EIS, where we talk about

radiological consequences in the EIS; not in the land use part of the EIS. It's separated that way.

COMMISSIONER APOSTOLAKIS: So we do look at the --

GREGORY HATCHETT: The radiological part of the accident section of the EIS.

COMMISSIONER APOSTOLAKIS: And, what was the result --

GREGORY HATCHETT: Again, we didn't find any changes from the ESP EIS.

COMMISSIONER APOSTOLAKIS: Okay, you didn't find any changes but the original finding was what?

GREGORY HATCHETT: It was small.

COMMISSIONER APOSTOLAKIS: And how does that compare with what happened in Japan?

GREGORY HATCHETT: Again, we're talking about an AP1000 reactor, not a boiling water reactor. And we're talking a plant that if you're looking at things like, again, -- stating for the record, we're not severe accident experts here, but as we followed a review to inform what we do for the environmental analysis. Okay, this plant has a -- it's passive 72 hour coping, it's not an eight hour coping. All these other features related to the AP1000 are not necessarily applicable to a boiling water reactor that was in the accident at the Fukushima site. We're focused on the specific applicable reactor and the specific site that's, you know, a few hundred miles or so inland from the shore, in terms of looking at a earthquake and a coincident tsunami occurring at this site is not necessarily something that's like --

COMMISSIONER APOSTOLAKIS: That's initiated [unintelligible] --

GREGORY HATCHETT: Yes. More than likely at this site.

COMMISSIONER APOSTOLAKIS: If I understand from what you're saying, that you do not expect from the calculations shown that even in the case of a severe accident [unintelligible] you do not expect to see the radiological consequences of what we saw in Fukushima. Is that what you're saying?

ROBERT SCHAAF: I think one of the distinctions in the severe accident analysis that's done for the environmental review, the impact determination takes into account the probabilistic analysis and it's a probability weighted consequence evaluation.

COMMISSIONER APOSTOLAKIS: Okay, what does that mean?

GREGORY HATCHETT: Again, I mean to provide you with a more specific response, we'd have to engage our severe accident counterparts, but again it's a tag-a-long kind of thing. We look at the release, the date, the date provided to us, I mean we take that release and do the consequence calculations --

COMMISSIONER APOSTOLAKIS: The question I have is --

GREGORY HATCHETT: So nothing's changed to date, so if we need to get back to you with a more specific response, we can --

COMMISSIONER APOSTOLAKIS: Wait, wait, wait. I'm not questioning the severe accident analysis. You say you start with the release. So the question is, with the release that they gave you, you are concluding that we will not have a decided radiological impact similar to those at Fukushima?

GREGORY HATCHETT: I'm trying to make the distinction between what could happen what happened at Fukushima, what could happen with an AP1000 reactor at this site. And I don't believe that it's necessarily comparable in

terms of trying to draw the same --

COMMISSIONER APOSTOLAKIS: What could happen is the [unintelligible] of a severe accident, so they did that calculation. Somebody else made that calculation. They gave you the release. Now, does that release lead to radiological consequences similar to Fukushima, or not?

GREGORY HATCHETT: Again, what I'll state, Commissioner Apostolakis, in looking at what we did, we do not have or believe that it's an issue for this site because the AP1000 reactor has been designed to withstand those types of severe accidents or external events.

COMMISSIONER APOSTOLAKIS: So that's part of a severe accident analysis. Your conclusion is, that given the release of the severe accident people give you, you will not have the same consequences --

GREGORY HATCHETT: We're still bounded within the ESP conclusions.

COMMISSIONER APOSTOLAKIS: So they practice moderate --

GREGORY HATCHETT: Small.

COMMISSIONER APOSTOLAKIS: Small. Okay, that's what I asked. When you calculate, by the way, when you have a severe accident just in general, you calculate the consequences. That severe accident most likely will be the result of some severe external event. Are you including in your calculations the fact that maybe the area will be devastated in an earthquake or something, there's a really significant impact. Or, are we assuming, that everything as before we had a ground acceleration of .4 G's, but it only affected the plant and we're calculating the consequences. Which one are you --

GREGORY HATCHETT: I wouldn't want to speculate here about .4 G's or all these other issues. I know that we have staff that do the severe the

accident calculation, they use the Madison code, but if you want more specific responses, we can provide it, because we don't --

CHAIRMAN JACZKO: Can you please provide that?

GREGORY HATCHETT: Yes.

COMMISSIONER APOSTOLAKIS: Yes, okay, so, thank you very much.

CHAIRMAN JACZKO: Commissioner Magwood?

COMMISSIONER MAGWOOD: Thank you, Chairman. Interesting dialogue from my colleagues. It sounds like if there was a major external event that the only thing left standing in Georgia would be the AP1000, but I guess we'll find out when we get the information from the record, but --

COMMISSIONER APOSTOLAKIS: [inaudible]

COMMISSIONER MAGWOOD: During your presentation -- well, first let me say, I did spend a lot of time going through the EIS and a lot of the supplementary material including trip reports and everything else. My impression before coming to NRC about NRC's Environmental Impact Statements because of the nature of these EISs versus what other agencies do -- I thought they would be more pro forma, but I was actually quite impressed with the effort that went into, you know, the environmental analysis, so I just wanted to pass that on and congratulate everybody.

MALLECIA SUTTON: Thank you.

COMMISSIONER MAGWOOD: You're very welcome. You mentioned that this was the first EIS, and I hadn’t thought that. You said that the ESP didn’t rely on a PPE, performance plan envelope. How do you think it would have affected your review of these global EIS had they used a PPE? Do you have a sense of that how it would have impacted your analysis?

MALLECIA SUTTON: Well, North Anna the other ESP EIS and it only took a couple months longer than the Vogtle ESP EIS took to complete. And I don't have a copy of my supplement that the team did, but there's approximately 100 some pages of the supplement for the Vogtle and North Anna is quite substantial, so it does cut down on the bulk of the review, because everything was -- there's no deferred issues for the Vogtle supplement.

COMMISSIONER MAGWOOD: Okay, so it would be a significant extra effort to go from an ESP with a PPE versus this applied specific one, so it's pretty significant.

GREGORY HATCHETT: So, what I think we're talking about here is the difference has to do with how many issues get resolved at the ESP stage, even if they would use a plant parameter envelope, if they decided to address, for instance, need for power at that stage, or energy alternatives at that stage, we would have to re-look at it, except for new and significant information once we got it to COL.

But most folks who have done it, other than Vogtle, have deferred a lot of issues to the next phase. And being a plant parameter envelope or not, resolution of significant issues is a key driver, and what the remaining amount of work the staff has to do.

COMMISSIONER MAGWOOD: So there really is a good comparison --

GREGORY HATCHETT: Not to date, on that front.

COMMISSIONER MAGWOOD: A couple of minor questions. As I went through the EIS I spent some time looking at the comments. And I noticed one comment, I know this is probably completely unfair, to pick out one specific comment and see if you remember this, but it's on page E37, where the commenter

noted that there was a study supposedly from University of South Carolina that showed elevated levels of cancer around Vogtle site, higher mortality rates in Burke County. If you happen to remember that, did the staff look into that report and concluded whether any relevance to what you were doing?

MALLECIA SUTTON: I've got the response. Robert can add additional information. At the public meeting, the staff did receive some information and when the staff came back, the staff probably Rich Emch did an analysis and also contacted the CDC, there was indicated there was a slight increase. But the increase was below the state level and below the national level. And there was no information that was linked to the proposed action in front of the agency.

COMMISSIONER MAGWOOD: Was there any information linked to the operation of Vogtle One and Two to increased incidence of cancers or anything like that?

MALLECIA SUTTON: There was no causability linked to any of the existing plants as well.

COMMISSIONER MAGWOOD: So, there's a part in the radiological numbers, I guess, just okay -- [unintelligible] the University of South Carolina study, it was a real study?

MALLECIA SUTTON: I cannot talk on the --

COMMISSIONER MAGWOOD: Okay, that's okay. Like I said, it was just a specific comment. Another question, I was reading, in reading the comments there were some people who were, I guess, concerned about the environmental justice impacts of the project. And one commenter said something that sort of resonated with me, which was, no one asked them what they thought. And I just wondered, what's our process? We go through the environmental justice

analysis, can you talk to the affected populations? Is there a practice of meeting with people? How do you know whether you've covered the ground or not?

MALLECIA SUTTON: The staff of environmental justice review deals with the contact local states, we contact departments of service, and we try to ask them if they know of any population or minority groups that we need to be aware of. At the time of the ESP EIS and FSEIS, there was no information provided to the staff that there was any pockets of concern that we needed to be aware of. So the staff concluded that the information from both the ESP EIS and the supplement remained bounded.

COMMISSIONER MAGWOOD: So based on information you got from the state, is that what you're saying?

GREGORY HATCHETT: We did interviews, the staff did interviews in all three counties. I believe it was three counties. It was Burke County, Columbia County, no four counties. Screven County and Richmond County. And then we talked to all of the leaders and social services folks, we talked to -- we interviewed folks at the local school districts, by trying to uncover information in the overall socio-economic and environmental justice review process. And by doing that, that leads us to beyond the table-top exercise of doing the census block review, and evaluating the applicant's information in the ER, so that we can make sure that we're very thorough. And so we found no pathways or issues, related to environmental justice that would change our conclusions from the ESP stage at the supplement.

COMMISSIONER MAGWOOD: Thank you, thank you very much Chairman. Thank you Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman. I have a question for the staff. Did the Environmental Protection Agency review or comment either on the FEIS or the SEIS for your process?

MALLECIA SUTTON: Yes.

COMMISSIONER OSTENDORFF: Can you comment briefly on the EPA comments and were there any big concerns?

MALLECIA SUTTON: The EPA had no big concerns on either the ESP EIS or the FSEIS and any comments or clarification in that EPA requested the staff did update the documents to reflect that information within the documentation.

COMMISSIONER OSTENDORFF: Was there any engagement or any interaction with the Army Corps of Engineers throughout this process? And if so, can you describe that?

MALLECIA SUTTON: During the Army Corps permit that was issued, with Vogtle, the Army Corps and myself and the staff spoke about the issuance of this permit. The Army Corps of Engineers actually tiered off the supplemental environmental impact statement for issuance of the permit for the applicant.

GREGORY HATCHETT: Just to clarify, commissioner. When the staff went out at the ESP stage we informally interacted with the Corps of Engineers and asked if they would become a cooperating agency. They declined because it didn't have a 404, section 404 Clear Water Act permit action in front of them, but we continued those informal interactions all the way through to the SEIS stage and in fact, I'll note, that we made sure when we made sure that when we were doing our cumulative impact analysis on the transmission line, because the transmission route, it had been determined it was a representative delineated

corridor. We communicated directly with the Corps to make sure we were using the same information, and in fact we were.

COMMISSIONER OSTENDORFF: A supplemental question, I'll just tack on to that question. People, living in the state of Georgia or South Carolina, you know right across the river, would not distinguish between one agency of the federal government or another, whether it be NRC, DOE, EPA, Army Corps of Engineers, et cetera. Based on your informal discussions and the liaison between your staff and the Army Corps of Engineers, where there any fundamental differences as to how they approach some of these environmental issues, looking for coherency, consistency, or a divergent system of how the NRC is looking at things and how the Corps is.

GREGORY HATCHETT: Going back to the response yesterday that Barry Zalcman provided, just by process we all follow sort of the guidelines laid out in the CEQ and particularly how NRC adopted the section 1022C in its regulations, so you know going out, putting out a notice of intent, putting out -- having a scoping meetings, there's some difference in how the Corps does their scoping and -- public interest review they called it, but in terms of, just, fundamentals of doing an EIS, we are not inconsistent.

COMMISSIONER OSTENDORFF: Okay, to stay on the same topic and then shift back to the applicant here, I assume you have a number of permits you need to apply for and receive in the state of Georgia, is that --

DALE FULTON: That's correct, we do.

COMMISSIONER OSTENDORFF: At a high level, are there any -- I'm trying to understand how we all wind up in the federal, state, local authorities, big differences as to approaches in the environmental area. Are

there any big differences in the approaches or the kind of questions for you to answer to the Georgia authorities, for say, the water-use permits, and the kind of question you get in those kind of areas from NRC staff?

DALE FULTON: I think the way I'd answer that is the process, is while this is for a NEPA analysis, when we're going after and applying for a permit, we provide environmental information and typically for an example for water withdrawal resources we reference the environmental evaluations conducted as part of our ESP and COL EISs, and therefore -- the governing agency takes that into consideration when they're determining whether they're going to grant us a permit. Now keep in mind that once our NEPA process stops, it doesn't stop our environmental oversight of the construction project and into operation. We will still have permit conditions that we will have to abide by, we'll still have compliance regulations that we'll have to abide by and we'll continue to provide that oversight to ensure that we remain in compliance with those permits and regulations.

COMMISSIONER OSTENDORFF: From where you sit, are there any significant substantive differences between what you would have to satisfy at the state level, compared to the NEPA requirements that we're looking at?

DALE FULTON: I would say, I don't see a significant difference, no.

COMMISSIONER OSTENDORFF: Thank you. Thank you Mr. Chairman.

CHAIRMAN JACZKO: Well thank you everyone for your good presentations this morning. we will take a break for lunch for about an hour and come back at 1:30 and then have closing remarks. Thank you everybody.

(Whereupon, at 12:26 p.m., the above-entitled matter recessed to

reconvene at 1:25 p.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

1:25 p.m.

CHAIRMAN JACZKO: Okay, well again, we'll just review everyone, please state their name and title for the record.

WHEREUPON,

MICHAEL JOHNSON

FRANK AKSTULEWICZ

ROBERT SCHAAF

were called as witnesses for the staff of the Nuclear Regulatory Commission and, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:

ROBERT SCHAAF: Robert Schaff, acting director, Division of Site

and Environmental Reviews.

MICHAEL JOHNSON: Michael Johnson, director of the Office of New Reactors.

FRANK AKSTULEWICZ: Frank Akstulewicz, deputy director for New Reactor licensing.

WHEREUPON,

CHUCK PIERCE

BUZZ MILLER

were called as witnesses for the Southern Nuclear Operating Company and, having been previously duly sworn, assumed the witness stand, were examined and testified as follows:

BUZZ MILLER: Buzz Miller, executive vice president for Southern Nuclear Company.

CHUCK PIERCE: And I'm Chuck Pierce, licensing manager for Southern Nuclear.

CHAIRMAN JACZKO: All right, we'll begin then with the applicants. Fifteen minutes.

BUZZ MILLER: Okay, I'd just like to start by saying thank you to the Chairman and thank you to each of the Commissioners for your own time and effort put into this; I want you to know we do appreciate your insights, we appreciate your questions and we're going to try to address some of those today. We do believe this hearing has demonstrated the exhaustive nature of the staff's review and the validity of the staff's safety and environmental findings. We agree with the conclusion that the AP1000 design is safe and that this commission has the information to make the necessary findings. I'd like

to follow up on a few items raised during discussions during the hearing and then our team can answer any further questions you may have. First, I would again like to recognize the professionalism of our Southern Company team and the NRC staff as well. Commissioner Apostolakis asked about the level of effort, yesterday, applied to developing the Vogtle Combined License Application. We looked into that last night and we confirmed that Southern Nuclear, NuStart, and contractors for Southern Nuclear have expended several hundred thousand man hours to develop the application and to support its review by the NRC staff since 2005.

Next, in our opening presentation I spoke briefly about our readiness to begin construction of the nuclear island rebar. To reinforce our overall readiness, to continue construction I want to expand on those thoughts. Southern Nuclear has developed a robust construction oversight program already. Our oversight organization is currently manned by over 200 individuals having both construction and nuclear operations experience. This organization is involved in quality assurance, licensing, vendor surveillance, construction oversight and engineering. Our organization will grow as this project evolves. Today approximately 1,200 craft workers are performing construction on the site. Several thousand additional craft jobs will support the increased construction activity in the future. With regard to ITAAC, both Southern Nuclear and our suppliers recognize the critical role that ITAAC plays in providing reasonable assurance that the plant is built as licensed. To that end we will be implementing an integrated approach with Westinghouse and Shaw in planning for executing and documenting ITAAC performance. Looking forward, Southern Nuclear recognizes that we must have a fully trained operational staff

at the time of turnover and eventual start up. Training of our operations staff is well underway. We currently have four cold license classes representing 62 operators in our operator training program. Another three cold license classes are scheduled in the near future.

In terms of regulatory oversight, which was mentioned yesterday, the NRC staff mentioned in their response there are approximately 35,000 man hours per unit planned for NRC oversight and inspections of the Vogtle three and four units. I'd like to point out that Vogtle already has two NRC residents, full-time, at our site that monitor daily activities. A third resident is expected on site in January and we anticipate seven full time residents eventually during the construction progress. Additionally, Southern Nuclear is averaging approximately two on-site NRC region two inspections per month currently.

Next, I'd like to touch on the topic regarding containment cleanliness that was discussed yesterday. Consistent with operating plants, containment debris limits are not typically implemented as technical specification requirements. From a licensing -- licensee operating perspective, a technical specification is treated no more significantly than a design basis limit identified in the licensing basis, whether it is treated as Tier 2 Star or Tier 2 material. Should a licensee identify through sampling that the debris limits have been exceeded as discussed yesterday, the plant would be considered to be outside the design basis and in an unanalyzed condition. Therefore, we would remain shut down until such time the design basis to support operation could be restored. We do not take a graded approach to compliance.

Relative to seismic questions, a question came about the meaning of FSAR Section 19.55.6.3 during the discussion of seismic margins. We have reviewed the wording in that section and while we recognize the wording could be crafted in a more artful fashion, the information provided is correct. The section means that for site specific conditions concerning soil related failure modes, the demonstration of adequate seismic margin is performed for a review level earthquake equal to 1.67 times the Vogtle GMRS. Thus, both the calculated seismic -- specific seismic response and the seismic loads are scaled up by a factor of 1.67. And we can answer further questions about that if desired.

Finally, I want to address again our request for Limited Work Authorization Bravo and clarify several issues that arose during the hearing. Limited Work Authorization Alpha, which was issued with the early site permit for Vogtle 3 and 4, did include the authorization to install safety related backfill in the nuclear island foundation in addition to the mud mat waterproof membrane and mechanically stabilized earth retaining walls.

Similarly, Limited Work Authorization Bravo includes safety related work including installation of rebar and nuclear island foundation base slab for the nuclear island foundation. The foundation design was a necessary component of the application for Limited Work Authorization Bravo. But to be clear, we incorporated that design information from the DCD rather than including it verbatim in the Limited Work Authorization Bravo request in order to avoid duplicative reviews by NRC staff of the same foundation design. We believed at the time and believe now that such redundant design reviews could have resulted in inconsistencies in the design reviews. And the inefficiencies

also could have delayed the DCD further and ultimately the combined license.

We are committed to maintaining the standards of quality that this Commission demands, regardless of when the Commission acts on our application. However, as I said yesterday, the continuity in our construction processes that Commission -- the continuity in our construction processes provided by the -- that Commission action upon DCD information would provide greatly enhances our ability to maintain those standards. We believe that the evidence presented yesterday emphasizes that our applications satisfies all Commission regulations and requirements and we once again respectfully request that this Commission act on the application at the earliest possible opportunity to approve the combined license and Limited Work Authorization Bravo.

Mr. Chairman, thank you again for your efforts. Thank you as well to your fellow commissioners. We welcome any further questions you may have regarding Vogtle Units 3 and 4 combined license application.

CHAIRMAN JACZKO: Thank you. Now we'll have the staff give their closing statements.

MICHAEL JOHNSON: Thank you, Chairman. In its SECY information paper, in the staff's FSER and FSEIS and in its presentations during this hearing, we have explained why all the findings necessary to issue combined licenses and limited work authorizations can be made. In doing so, we demonstrated why the Commission can agree with the staff's review of the application – that the staff's review of the application has been adequate. The review was appropriately focused by the finality accorded to issues within the scope of the reference ESP and AP1000 design certification. We have demonstrated this thoroughness -- the staff has demonstrated the thoroughness

of its safety review. We explain the use of a design centered work review approach. We discussed the relevant information incorporated by reference from the AP1000 design. We've explained our review process, the use of staff guidance and interactions with the ACRS including the ACRS's agreement with the staff's conclusion regarding the Vogtle application.

We highlighted the novel aspects of our safety review and security review particularly with regard to issuance of -- including materials licensees under Parts of 30, 40 and 70, loss of large areas of the plant due to explosions and fires and the first cyber security review completed for a new reactor application.

We also explained the adequacy of our environmental review, the relationship of the Vogtle ESP/FEIS as the crucial starting point for efficient development, of our SEIS, how the fact that the Vogtle -- how the fact that Vogtle referenced a complete ESP resulted in review efficiencies expected under Part 52 process including the appropriate focus on new and significant information. Our compliance with the NRC's NEPA regulations in Part 51 and other applicable environmental statutes, and appropriate interactions with other government agencies and the public. And finally, how the environmental review appropriately accounts for impacts of the requested LWAs.

The Office of New Reactors has found that the application, the final safety evaluation report, the final supplemental environmental impact statement and the staff’s statement of support of this hearing to provide an adequate basis for meeting the necessary findings set forth in 10 CFR 5297, 50.10 and 10 CFR 51.107, supporting issuance of the combined licenses for Vogtle Units 3 and 4 and also for issuance of the LWAs.

As required by 50.10, we believe there are no unresolved issues relating to activities to be conducted under the LWA that would constitute good cause for withholding authorizations and for all these reasons, the record supports issuance of combine license -- of the combined license and the LWA.

As a final thought -- and this relates to discussions that we had on a number of issues regarding the regulatory vehicle chosen by the staff -- we're confident with respect to the work that was done by the staff in consultation with OGC to support the regulatory findings as previously discussed. We're similarly confident with respect to Part 52 processes related to post COL issuance activities and tools including ITAAC, including construction, reactor oversight process, including inspection of construction, including inspection of operational programs, inspection oversight transition to operations. Those activities will enable us to confirm that the plant will have been built and will operate in conformance with the license, the Act and the Commission's regulations.

Whether or not we chose a tech spec or an LCO or regulation, in specific instances I would just note that they're all requirements. Licensees understand the necessity of complying with requirements whether it be regulations or tech specs or conditions of license.

Licensees also understand what needs to be done and when they find they're violation of the requirements including determining the safety significance, determining operability, determining the extended condition, taking prompt and corrective action including restoring compliance. In those instances in which we relied on commitments, we've done it in accordance with the Commission's commitment policies and practices. And there is an

established an improved process by which licensees maintain commitments and implement changes and we oversee those changes.

I would note finally that there are several questions -- there were several questions that were raised during the course of the mandatory hearing. We will provide supplemental responses in accordance with Commission procedures and any direction that is provided by the Commission. The staff certainly appreciates the time of the Commission and the opportunity to present to the Commission the results of the staff's review.

With that, that concludes our presentation.

CHAIRMAN JACZKO: Well thank you, Mike. We'll now have the short round or six minutes for each of the Commissioners to make any closing comments or ask any additional questions and then we will conclude.

I'll start just with a question and then perhaps a brief statement. This is certainly a significant activity for the Commission and I think the last day and a half has shown that there's a tremendous amount of work that's been done both on the applicant side on the part of the staff to carefully and thoughtfully prepare information and then carefully and thoughtfully review that information.

I think it's also clear that there are always going to be areas of imperfection in what we do and uncertainty. Because I look at this information and the question for me in those areas that are unresolved and as we make the findings, are any of those areas of uncertainty or imperfection significant enough to warrant not making findings? And that's the question that I think I'll have to look at, certainly, with all these Vogtle issues in other ways.

I just -- I can't help commenting on a certain aspect. I think,

Mike, your statement was -- your statements about the fact that we are all perfectly aware and perfect players in compliance space, I just think is not a real reflection of how things work. Six years on this Commission, I have found that there is most often, when these kinds of things get into practice, there is discussion, there is back and forth. It's not simply a simple statement by the licensee that, well, we understand what's required for compliance and we're going to do it. It's usually a back-and-forth. So in those areas I pushed, I pushed because I know how these things play out. And they don't play out as simply as we make it sound right now, where everyone just goes about it and if they were to say something everybody says, well, we'll happily comply. That's not a value statement or a negative statement against the applicants; it's part of the business.

But I do think there are areas in which there are subtle differences and those subtle differences do play out significantly when it comes to enforcement and the actual implications. And this is a very significant action we're taking, to license a facility with this action. It is not to issue a construction authorization. It is to give an operating license for the facility. That's a very, very different step and it's one we've never taken really as an agency before. So as I said, those areas of some uncertainty and imperfection that I've seen, that will be how I look at this. Are these things that will manifest themselves in a way that is challenging as we go forward?

But I did want to touch on one issue which we haven't really touched on directly. This is a significant activity today. It's a very different activity today than it would be if this happened in February or early

March of this year. And we haven't really touched upon how we deal with the events of Fukushima Daiichi. And very early on in this situation I was asked a question about how would we move forward with new reactor licensing in dealing with the lessons of Fukushima, and what I said at the time and what I still believe is that the timeline for those activities are generally somewhat consistent. The licensing action, we still have a little bit more work to do and if things move forward smoothly, we'd probably be in a position to have a final decision sometime end of this year or early next year on the Vogtle application. We should presumably also by the end of the year have a good sense of where the Commission stands on a lot of the post Fukushima actions.

So, what I think is still missing is how we somehow tie those activities together. What is the linkage between what we're doing with Fukushima Daiichi, what we're going to be doing with the final decision on the licensing of Vogtle? And if that license is in the affirmative, how do we ensure that in the right way we are incorporating and securing what will likely be a series of efforts and activities. So I would like to just offer that first, to you Mike, and to Buzz or any of the -- anyone else who would like to comment on what they see is the best way to kind of marry those two activities together.

MICHAEL JOHNSON: Thank you, Chairman. In terms of moving forward, I think it is important that we stay connected with the operating fleet in terms of those actions that would play out. And in fact, as you are well aware, I'm a member of that group, looking at the actions directed by the staff in terms of what we'll do moving forward. Our plan would be to follow those actions, to be involved in consideration of those actions, in fact, and to

raise for the Commission's consideration those actions in terms of how they play out on new reactors. Those actions, once decided by the Commission in terms of requirements, would be actions that we would take using our process to go back to the design cert if appropriate, to the COL as appropriate to adjust those requirements to adjust the license, if you will, depending on how those requirements play out. So we're attuned, we're in step working certainly with the AP1000 and Vogtle in terms of putting into place the actions decided by the Commission with response to Fukushima.

BUZZ MILLER: Just to say it in a slightly different way, much like we're confident our operating reactor fleet is safe and should continue operating, we don't believe there's a technical basis to hold back this licensing process. And the Commission has the same tools for license -- this post licensing that you do for our operating fleet. And it's not like it goes away so you still have the same opportunity to come back to us.

CHAIRMAN JACZKO: Well, thanks a lot. I appreciate those answers. I have to say I may be in a slightly different place. We do have a big tool right now which is the issuance of a license. I think we have an obligation to make sure that we don't miss the opportunity to put in place the right kinds of -- whether it's a license condition or whether it's some other statement that does connect these things in a more significant way. Because it's one thing to have an existing plant that has a licensing process, in my mind, and then to go back and use our process to adjust that and adapt it versus one that we newly licensed. We have the ability, knowingly, affirmatively to make that decision, knowing what we know about what happened in Japan. And I think for us to simply ignore it, to say we'll take care of it -- if we issue a license we'll

take care of it later -- I think that's missing, I think, an obligation that we have all the more to the public to address those issues. So I -- it's certainly something I'll be looking at as we go forward. I appreciate your answers and I appreciate your work.

COMMISSIONER SVINICKI: Well, I will join in thanking everyone or doing some acknowledgments and then I do have a couple of specific questions and then I'll close in the six minutes here.

First of all, I would like to thank the applicant and the team there for a very informative and a very vigorous defense of the application. It's clear that a lot of careful work has been done and it's clear that there's been exhaustive engagement with the NRC staff and so I would also congratulate the Office of New Reactors in again, getting to the milestone of being here to defend their review process for this application.

I also want to acknowledge that the Commission is supported in this adjudicatory role here presiding over this hearing by our Office of Commission Appellate Adjudication and the Office of the Secretary of the Commission who really provided phenomenal support to the Commission in this role. It's not something that the technical staff necessarily gets to see but I don't think the Commission could do what we do without the support of some of our commission level offices. So I appreciate that as well and people have had to do things on tight timeframes so I wanted to acknowledge that.

My two specific questions have to do, first of all, Mike, it's a little bit of what you talked about in post issuance of a license. There's still lot of important work that goes on. So you mentioned ITAAC but I was just going to ask you, are you confident based on the continued level of

interface between the applicant and the NRC staff, those who are directly responsible for the successful execution of the ITAAC process, do you think that we continue to have a level of interface there that makes you confident today of the ITAAC process moving forward effectively?

MICHAEL JOHNSON: I am confident of the process and the interfaces that we have. I think the work incredibly well. I also have learned that there can be surprises and we'll be alert for those surprises. Some of those surprises can mean that we'll have close interactions, closer interactions to resolve specific issues as they unfold. I'm confident moving forward today based on the work that we've done and the changes that we've put in place with respect to our process that we can execute including the implementation of the ITAAC program.

COMMISSIONER SVINICKI: Okay. And it wasn't a trick to have you somehow indicate that we live in a world where there weren't going to be some issues that are arising. And so I would ask Mr. Miller as well, do you feel that the level of communication with the staff leaves you confident in the ITAAC process, both what you're responsible for and the successful execution of the processes as it exists today?

JOSEPH MILLER: I would say absolutely yes, particularly based on the experience we have to date, on the new ITAAC that we have.

COMMISSIONER SVINICKI: Well and I -- it may seem I'm overemphasizing the point but I think it gets to a little bit of what Chairman Jaczko talked about, which is that this is -- this Part 52 process is very different and so a lot of really important confidence measures reside in that ITAAC process. So as the Commission concludes this hearing this afternoon and

moves forward in terms of the findings, that's certainly not the end of anybody's kind of confidence building measures that we need to have successfully executed to move forward in this process.

The other specific question I had was about the changes during construction license condition which provides for the ability for the licensee in conjunction with some level of a license amendment request to request something that I think is kind of novel: to request a notification that the NRC has no objection to the licensee constructing the proposed changed design feature pending the NRC's review of the license amendment request. And I -- again, I know we don't live in a perfect world so it may be that during construction, we would find ourselves in a circumstance of needing to exercise this process, but I would ask the applicant if they anticipate at this time that they would invoke this opportunity of trying to get a kind of a no objection to continuing at risk in this process.

CHUCK PIERCE: I would answer that in two ways: One is, at this time we don't -- do not know an amendment that we would use the process for.

COMMISSIONER SVINICKI: Okay.

CHUCK PIERCE: Having said that though, if there is an opportunity where our construction project may be impacted through a license amendment, that we come across while we're doing construction, I think we would apply that process at that time.

COMMISSIONER SVINICKI: Okay, thank you. And so I think just as a closing thought then I would state, that I talked a little bit in the opening about all the work that's gone forward by the previous commissions and others who developed this Part 52 process and we do have the clarity of findings that

the Commission will need to make in this case. And so I think I'm in agreement with Chairman Jaczko, that it is for each commissioner, then, a threshold judgment to be rendered here on whether, again, we have the staff's view that they put forward that the findings could be supported. But it is for the Commission itself now to determine whether or not the preponderance of that evidence has been put forward in a way that each commissioner is confident he can support those findings. So that's what I think each member on this side of the table will be undertaking in the coming times. So, thank you again. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Apostolakis.

COMMISSIONER APOSTOLAKIS: I join my fellow commissioners in complementing the staff and the applicant witnesses for their significant efforts in preparation for this hearing. I also recognize and appreciate the efforts of the hundreds of others who have completed the review of the Vogtle COL application as well as the earlier ESP review and AP-1000 design certification amendment agreement. One can't help but be impressed by the amount of resources that have been devoted to this effort, the number of public meetings, the number of requests for additional information, the support for ACRS reviews and the breadth of the requirements that have been addressed.

At the same time, as my colleagues have indicated, the Commission is feeling an important responsibility in assessing the adequacy of the staff's review. This review represents a major milestone in new reactor licensing, with many firsts of a kind, and yet is also the culmination of efforts of that began in the 1980's to provide a more efficient and effective licensing process for new reactors, the Part 52 process. Thus it is both a privilege and a

challenge to be participating in this hearing.

I found this to be a learning experience in many ways, partly because of the many first-of-a-kind facets of this hearing but also because the record is quite detailed and complex. I have benefited from the opportunity to probe analyses that I wanted to understand better. We have an extensive and invaluable written record, but the question and answer periods were very beneficial in getting information, in getting additional perspective on key issues. We now have much food for thought and I will carefully review post hearing responses to questions as I deliberate on the issues raised. Thank you.

CHAIRMAN JACZKO: Commissioner Magwood.

COMMISSIONER MAGWOOD: Thank you, Chairman. Well, let me not go without thanking everyone who has already been thanked, particularly the staff did a -- not so much for what was done over the last couple of days but really for the effort that has taken place over the course of the year, and I know how much work has gone into this. It's been well represented here over the last day and a half and as I mentioned earlier, it's an impressive body of work.

Buzz, you and your team, I appreciate everything you have gone through in the last day and a half answering all the questions. I guess you should probably reflect on the fact, this is probably the easy part as this process goes forward, because the real hard part comes after we make a judgment, assuming this project goes forward. And other -- also Commissioner Svinicki highlighted the role of the SECY and OCAA, the roles that they played in helping us put all this together. Very important, couldn't do it without you; thank you for all that. Also wanted to thank people who helped me, Mark

and Molly are over there somewhere -- there they are -- for all their help and all the time they spent putting all the material together for me.

I sort of stepped back and thought about this process a little bit and it occurs to me that for many countries, when the federal government gets involved and the national government gets involved in a process like this, the kinds of questions that come up are rather different from the questions we've dealt with today. The questions that come up are often, you know, economic impacts. What does it do for employment? What does it do for local development? What does it do for energy security? Those are the kinds of questions they usually come up with, national governments. I think there really is -- it's worth stepping back and remembering that our role in that is so very different and we're so -- and the way we handle things in the United States is so very different from the way that other countries handle it. That -- I think, you know, the fact that our role precludes even the consideration of those issues, despite the fact they're very important and clearly, you know, the White House and others have been pushing very hard to find ways of increasing employment and reducing red tape. We're isolated from that and we have the opportunity to sit back and think about the single mission of this agency, which is protecting the health, safety and security of the American people, and so we are able to do that.

And so I think it's important to remember that while we go through that, we have before us a very long and complicated process to think about with those issues of health, safety and security. And as I've said on other occasions and will repeat today, I never apologize for that. And I don't think that -- and clearly the staff shouldn't apologize for that and really, the

applicant should never apologize for that. I know that the applicant has to deal with a lot of different forces that don't understand why things take so long, why does it take so long to put a project like this together, but when you think about it, this is a project that, if it goes forward, will result -- it will be one of the biggest projects in the country if this goes forward. And it will result in a plant that will operate for 40, 60, maybe longer years. So this is very, very significant in every measurable way so it's worth every detail, every effort that goes into making this project get done the right way, every step of the way.

A couple items I just wanted to highlight: One is, we had a long discussion about squib valves yesterday. We didn't ask for anything further on the record but I think I'd like now to formally ask that we get a clearer explanation of what exactly is the situation there, because it seems to me that it's very difficult for us to make the finding that we're being asked to make if we don't know that the situation is stable right now. Not what happens in the future, but can we make a finding based on what we have today. I'd like to get the staff's view on that.

I have a comment about the EIS process. I think that the -- as I mentioned, a way that this agency does NEPA, or the way our view of NEPA is different from many other agencies, and the way that this particular document came together, it reference lots of other documents. It referenced the [unintelligible], it referenced ESP. And as you go through this document, it's very difficult to read it without having those other documents handy. And I noticed there were several comments from the public that it was very difficult to understand and assess what was going on. I guess what I would say is, just

because various parts of the analysis are no longer open for discussion doesn't mean you can't talk about them in the document. So simply stating ESP, we're not going to talk about it, I don't think that's good enough. I think there should be a more fulsome coverage in the ESP to allow the public to understand what's being proposed. Because when you think about it, the NEPA is really the one place where the broad public has an opportunity to hear and engage with the government over what's being proposed to go forward. So and I think we should think about the ESP process that way.

Final comment I will have, this is more of an encouragement for -- I'll direct it to Buzz. You have people in the Southern Company who were around the last time the Southern Company went through a nuclear plant construction project. I think it would be really useful for -- or maybe you've already done this -- to talk to those people as the process goes forward and give us an assessment, to not just us, but maybe to the broader community about how this process worked and what worked compared to what happened in the past. And at the end of the day, give us a grade; what did you think? How did this work? Did this process go the way you thought it would go? Where can we do better? Because we are going to make adjustments as we go forward. And this commission, as we go on to the next -- past this project and onto others, we'll probably make adjustments in the process going forward so we appreciate that input.

So with that I'll close and again thank everyone. I look forward to reaching a conclusion on our findings. I look forward to talking to my colleagues about that. I'm sure we'll have lots of views about what should be considered and again, I appreciate my colleagues as well. Thank you very much.

CHAIRMAN JACZKO: Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman. I add my thanks to those of my colleagues. I appreciate Southern's hard work and attention to detail on the application. Mike, you and your team, I appreciate what you have all done in your exercise of due diligence and a very thoughtful and careful review. I think you've done your job. I know we're going to get some post hearing calls from you guys on some questions that were asked yesterday and today, but I think you have a very good foundation for us to make a decision here as individual commissioners. We appreciate that very much. Thank you.

CHAIRMAN JACZKO: Well thank you, everyone. This concludes our -- what is an historic hearing in the -- really, for the agency, in completing the first mandatory hearing on a new reactor application since 1970 or I should say, conducting our first mandatory hearing. The NRC has demonstrated its commitment and effectiveness in meeting our important safety and security mission. As the past two days of hearings have demonstrated, the review of a new reactor application necessarily involves many important safety, security and environmental issues. On behalf of the Commission I want to thank the staff for their hard work over the past three years in reviewing the application in completing the final safety evaluation report as a supplement final and formal impact statement.

I also want to thank the staff as well as the applicant for their presentations and their responses to our questions over the past three days. This hearing has helped us better understand the important issues involved in the review of this application. Because of the discussions during this hearing, we will be in a better position to make an informed and considered

decision on this application. I believe the Commission is committed to moving forward with a decision on this application in a thoughtful timely manner that befits the importance safety issues under review.

While we have had a productive hearing over the past two days, we still have some work ahead of us before we reach a decision. And I look forward to seeing the supplemental responses to our questions. An order will be issued within the next seven days regarding those supplemental responses and any further follow-up questions. The parties should coordinate regarding any additional exhibits included with your responses so they are shared in advance and the Commission is informed of any objections by the time they are submitted. We expect a transcript of this hearing to be available within a few days. At that time, the secretary will issue a short order identifying the deadline for any transcript corrections. Although there is still some work ahead for the applicant, the staff and the Commission, I believe this has been a very productive hearing. Thank you all for your participation and this concludes our hearing. Thank you.

(Whereupon, at 2:12 p.m. the above-entitled matter was concluded)

E-N-D-P-R-O-F-P-R-O-C-D-E-E-D-I-N-G-S

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
SOUTHERN NUCLEAR OPERATING COMPANY	)	Docket Nos. 52-025-COL and 52-026-COL
	)	
	)	
(Vogtle)	)	
	)	
(Mandatory Hearing)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing COMMISSION ORDER (ADOPTING PROPOSED TRANSCRIPT CORRECTIONS, ADMITTING POST-HEARING RESPONSES AND CLOSING THE RECORD OF THE PROCEEDING), ON THE COMBINED LICENSES FOR VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 have been served upon the following persons by Electronic Information Exchange and by electronic mail as indicated by an asterisk*.

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Vogtle, Docket Nos. 52-025-COL and 52-026-COL (Mandatory Hearing)

COMMISSION ORDER (ADOPTING PROPOSED TRANSCRIPT CORRECTIONS, ADMITTING POST-HEARING RESPONSES AND CLOSING THE RECORD OF THE PROCEEDING), ON THE COMBINED LICENSES FOR VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4

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[Original signed by R. Giitter]
Office of the Secretary of the Commission

Dated at Rockville, Maryland
this 1st day of November 2011