UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAY 24 1979

DOCKET NOS. S 50-599/50-600

APPLICANT: COMMONWEALTH EDISON COMPANY

FACILITY: CARROLL COUNTY STATION

SUBJECT: SUMMARY OF MEETING HELD ON MAY 9, 1979

A technical meeting was held with the applicant on May 9, 1979 in Bethesda, Maryland. Attendance at the meeting is shown on Enclosure No. 1. The purpose of the meeting was the initial step in the implementation of Recommendation No. 3 of the NRC Study Group Report, NUREG-0292, "Nuclear Power Plant Licensing: Opportunities For Improvement" (see Enclosure No. 2). The schedule of events for the staff review of the Carroll County application is shown on Enclosure No. 3.

The meeting was the initial working level meeting between the staff and applicant prior to the tendering of an application (PSAR). The meeting was attended by representatives of various staff review branches with their counterparts in the applicant's organization. Aspects of the Carroll design, potential problem areas, current staff positions and the type and format of information needed to conduct a review were discussed.

The items discussed are shown on Enclosure No. 4. Due to the events of the Three Mile Island accident, adequate discussion treatment of several areas such as RESAR-412 and reactor systems was not achieved due to the unavailability of staff representatives. It was indicated that there was some doubt as to the ability of the staff to continue these pretendering activities in light of the reallocation of staff resources since the Three Mile Island accident.

Ralph A. Birkel

Ralph A. Birkel
Light Water Reactors Branch No. 2
Division of Project Management

Enclosures:
1. Attendance List
2. Recommendation No. 3
3. Schedule of Events
4. Discussion Agenda

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cc w/enclosures:
Mr. Donald G. Swanson, Chairman
Carroll County Board of Supervisors
Carroll County Courthouse
Mount Carroll, Illinois 61053

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MAY 24 1979

ENCLOSURE NO. 1

ATTENDANCE LIST
MEETING WITH COMMONWEALTH EDISON COMPANY
MAY 9, 1979

COMMONWEALTH EDISON COMPANY

G. T. Klopp
W. F. Naughton
J. D. Deress

SARGENT AND LUNDY COMPANY

S. Sen
O. Hrynewych
W. A. Bloss
R. G. Shields
M. S. Zar
R. J. Hammersley
J. J. O'Hara

WESTINGHOUSE ELECTRIC CORPORATION

W. E. Kortier
D. H. Rawlins
J. C. Conner
W. L. Luce
M. Oper
D. R. Richardson
D. W. Call

NRC - STAFF

R. A. Birkel
J. P. Joyce
S. Salah
D. Houston
W. L. Brooks
C. Haupt
R. L. Baer
F. Odar
W. Butler
W. Milstead
J. Shapaker
W. Jensen

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Enclosure No. 2

NUREG-0292

NUCLEAR POWER PLANT LICENSING: OPPORTUNITIES FOR IMPROVEMENT

Report by an
NRC Study Group

Study Group Chairman
Harold R. Denton

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Date Published: June 1977

U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

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5.1.3 Increase Pretendering Coordination with Applicants

A policy of routinely holding meetings with prospective applicants during the one-year period prior to tendering of the application has been in place for several years. One such meeting is held at the applicant's offices and deals exclusively with the Commission's quality assurance requirements. The primary purpose has been to inform the applicant of our quality assurance policy and information needs and of related review and inspection procedures. A second meeting, held at the Commission offices, is general in nature and includes a discussion of applicable regulations, standards and guides; documentation requirements; review chronology; and current technical issues and staff positions that the applicant should address. Additional meetings are held during the pretendering phase at the applicant's request.

The Study Group has considered expanding the present pretendering interactions to include several working level sessions between staff and applicant during the period 6 to 12 months prior to tendering of an application. Once design efforts are underway and while the application is being prepared, representatives of the various staff review groups could meet with their counterparts in the applicant's organization to review and discuss the key aspects of the design and relevant problems and current staff positions. The staff could identify more precisely the type and format of information needed to conduct their review. Members of the public and representatives of state agencies might also benefit from attending such meetings.

Pros:

1. In face-to-face discussions the applicant should be able to obtain a clearer understanding of the staff's requirements and submit an application addressing these needs. This would be particularly helpful in some review areas where it is difficult to be sufficiently definitive in written guidance to assure a responsive input.

2. Such working sessions could highlight potential design problems and might have a positive impact on design efforts prior to tendering. At a minimum, the staff would be alerted to such problems or unique design features early.

4. Review time and manpower might be saved during the review.

Cons:

1. A significant increased expenditure of staff manpower prior to tendering would be required.

2. The staff may be viewed as unduly influencing the design, with consequent reduction in objectivity in the subsequent review of the application.

Recommendation No. 3

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The Study Group recommends that NRR prepare an implementation plan and a policy statement for Commission consideration which announces the intent to expand present pretendering activities to include several working level meetings between staff and applicant during an appropriat period prior to tendering of an application. At these meetings representatives of various staff review branches should meet with counterparts in the applicant's organization to review and discuss significant aspects of the design, potential problem areas, current staff positions and the type and format of information needed to conduct a review.

Enclosure No. 3

50-599/600

Schedule Of Events
Carroll County Nuclear Station

PSAR	ESR	RESAR-412	TOPICAL REPORTS		
			FUEL (WCAP-9500 & 9401)	IPS VERIF. (WACP-)	DEMO. OF DID REQ'D BY NUREG-0493 (WCAP-)
MAY/JUNE '79 (PRETENDERING) (MTGR WITH APPLICANT)		MAY/JUNE '79 (PRETENDERING MTGR WITH (W))			
		JULY '79 (TENDER PDA)			
	SEPT. '79 (ISSUE DES)	SEPT. '79 (DOCKET PDA)			
JAN. '80 (ACCEPTANCE REVIEW OF PSAR)	JAN. '80 (ISSUE FES)				
	FEB. '80 (ESR ASLB HR'G)		FEB. '80 (ISSUE SER, WCAP-9401)		
JUNE '80 (DOCKET PSAR)			MAY '80 (ISSUE SER, WCAP-9500)	JUNE '80 (ISSUE SER)	JUNE '80 (ISSUE SER)
	AUG. '80 (DOCKET ER)				
		SEPT. '80 (ISSUE SER)			
DEC. '80 (ISSUE SER)		NOV. '80 (ACRS MTG)			
FEB. '81 (ACRS MTG)		FEB. '81 (ISSSUE PDA)			
APRIL '81 (ASLB HR'G)					
OCT. '81 (ISSUE LWA)					
APRIL '82 (ISSUE CP)					
		MARCH '84 (ISSUE FDA)			
APRIL '84 (TENDER FSAR)					
APRIL '88 (FUEL LOAD-UNIT 1)					
OCT. '88 (COMMERCIAL OPERATION-UNIT 1)					

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APRIL, 1979

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Enclosure No. 4

DISCUSSION AGENDA
CARROLL COUNTY PRETENDERING MEETING
MAY 9, 1979

CORE PERFORMANCE BRANCH
FUEL

For RESAR-412 and Topical Reports:

1. Fuel Performance Model (WCAP-8720) must be applied as approved with restrictions.
2. Fuel Rod Internal Pressure Criteria - must be applied as approved with modifications and analyzed by approved code above.
3. Fuel Rod Bowing - analysis with approved method.
4. Fuel Testing Program - confirmation of any significant changes from current fuel designs.

For Carroll County specific:

1. Asymmetric LOCA and Seismic Loads - Commit to address this issue in FSAR. NRC can discuss BTP for combination of loads for fuel assemblies.
2. Load Following Capability or Design
3. General Fuel and Control Rod Surveillance - Control Rod applicable if B_4C is used.
4. Thimble Tube Wear from Control Rods

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PHYSICS

Shutdown Margins (4.3.1.5)

Want clear statements on:

1. k_{eff} for refueling $\leq$ .95 with uncertainty
2. refueling all rods out k_{eff} 1 - is this with or without uncertainty. Justify if without.
3. $k_{eff} \leq$ .95 in spent fuel storage with uncertainty.
4. $k_{eff} \leq$ .98 in new fuel racks with optimum moderation is this with or without uncertainty and justify.

Limiting Power Distributions (4.3.2.2.6) Want complete description of controls scheme and F_Q limit if not 2.32 and CAOC as in WCAP-8385.

F_Q Uncertainty (4.3.2.2.7) Want complete description and justification of any change in uncertainty.

Vessel Irradiation (4.3.2.8) Want much better description of prediction and method verification, particularly new method for prediction of edge assembly power distribution used in fluence calculation.

Changes (4.3.4) Want any significant new physics areas discussed here.

Rod Drop (15.4.3) Want description of why rod drops do not need trip for all conditions, or want trip on any dropped rod.

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ANALYSIS BRANCH

SRP 4.4 (Omitted)

1. Loose Parts Monitoring
2. Rod Bowing
3. Thermal Hydraulic Design Method:
   "Old" Westinghouse method or "Improved Thermal Design Procedure"
4. DNBR Correlation: W-3 or WRB-1
5. Operation with one pump out of service (i.e., thermal hydraulic design)

SRP 15.0

1. For all the transients and accidents described in Chapter 15 we need the following information:
   a. Detailed nodalization diagram used to analyze the transients and accidents
   b. Detailed discussion of the calculational method used in the evaluation of the transients and accidents
   c. Detailed flow diagram for the primary and secondary systems identifying all the components considered in the calculational model used
   d. List of all the codes used in the transient and accident analysis with their review status
2. List of topical reports for transients and accidents and how these topical reports apply to Carroll County Project.
3. For all the analysis methods described, provide the following:
   a. model description
   b. data correlations
   c. empirical relationships
   d. solution techniques
   e. summary of computer codes
   f. sample problems
   g. experimental verification
   h. comparative calculations

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4. Core and system performance.

a. Mathematical model. The mathematical model employed, including any simplifications or approximations introduced to perform the analyses, should be discussed. Any digital computer programs or analog simulations used in the analyses should be identified. If a set of codes is used, the method combining these codes should be described. Important output of each code should be presented and discussed under "results." Principal emphasis should be placed on the input data and the extent or range of variables investigated. This information should include figures showing the analytical model, flow path identification, actual computer listing, and complete listing of input data. The detailed description of mathematical models and digital computer programs or listings are preferably included by reference to documents available to the NRC with only summaries provided in the SAR text.

b. Input parameters and initial conditions. The input parameters and initial conditions used in the analyses should be clearly identified. Table 15-2 provides a representative list of these items. However, the initial values of other variables and additional parameters should be included in the SAR if they are used in the analyses of the particular event being analyzed.

The parameters and initial conditions used in the analyses should be suitably conservative for the event being evaluated. The bases used to select the numerical values that are input parameters to the analysis, including the degree of conservatism, should be discussed in the SAR.

c. Results. The results of the analyses should be presented and described in detail in the SAR. As a minimum, the following information should be presented as a function of time during the course of the transient or accident:

(1) Neutron power,

(2) Heat fluxes, average and maximum,

(3) Reactor coolant system pressure,

(4) Minimum CHFR, DNBR, or CPR, as applicable,

(5) Core and recirculation loop coolant flow rates (BWRs),

(6) Coolant conditions - inlet temperature, core average temperature (PWR), core average steam volume fraction (BWR), average exit and hot channel exit temperatures, and steam volume fractions,

(7) Temperatures - maximum fuel centerline temperature, maximum clad temperature, or maximum fuel enthalpy,

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CONTAINMENT SYSTEMS
(INCLUDING CPR-SRP 6.2)

1. SRP 6.2.1.1.A (Rev. 1) - PWR Dry Containments
   a. LOCA Analysis
   b. Main Steam Line Break
   c. External Pressure
   d. R. G. 1.97
   e. Mass and energy releases (long-term LOCA, subcompartments (LOCA and MSLB), MSLB and long-term MSLB); See Attachment A
2. SRP 6.2.1.2 (Rev. 1) - Subcompartment Analysis
   a. Subcompartment Code
   b. Nodalization Sensitivity
   c. Margin
   d. Movable Vents
   e. Subcompartments
      (1) Structural
      (2) Equipment Supports
3. SRP 6.2.1.5 (Rev. 1) - ECCS Backpressure Analysis Including BTP CSB 6-1 (Rev. 1)
   a. Utility Requirement - Comparison
      (1) Calculated Pressure vs. RESAR-412 Calculations
      (2) Containment Input Parameters vs. Transient RESAR-412 Assumed Containment Input Parameters
   b. NSSS Requirement
      (1) Containment Transient Analysis
         (a) Approved ECCS Evaluation Model
         (b) BTP 6-1 (Rev. 1)
4. SRP 6.2.2 (Rev. 2) - Containment Heat Removal Systems
5. SRP 6.2.4 (Rev. 1) - Containment Isolation System Including BTP CSB 6-4 (Rev. 1)
   a. Diversity in Containment Isolation Signal
   b. BTP CSB 6-4 - Purge
   c. Reg. Guide 1.11 - R. C. Instrument Lines

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6. SRP 6.2.5 (Rev. 1) - Combustible Gas Control Including BTP CSB 6-2 (Rev. 1)
   a. Corrosion
      (1) Zinc Corrosion Rates
      (2) Temperature vs. Time Profile
   b. Monitoring
   c. Access
   d. Containment Isolation System
   e. Qualification of Recombiners
   f. Sharing of Recombiners
7. SRP 6.2.6 (Rev. 1) - Containment Leakage Testing
   a. Proposed Revisions to App. J
   b. Leak Test Duration

INSTRUMENTATION AND CONTROL SYSTEMS

1. Category 4 Item
   a. Environmental Control and Qualification Outside Containment (See Attachment B)
2. RESAR-412 and BOP Interface with the RESAR design
3 Equipment Qualifications to IEEE-323 1974

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REACTOR SYSTEMS

OPEN (Omitted)

POOR ORIGINAL

Attachment A

WLD
5-14-79

ISSUES RAISED
AT Conol County
Meeting 5-9-79

Long term LOCA

Q Will Conol use new westinghouse Method in a letter to Stolz 4-25-79?
If so need to Provide blowdown heat Transfer and steam condensation data comparision

A, Conol County will use WCAP-8312 which is already approved

SHORT TERM LOCA
for sub compartments

Q, Provide comparisions of break flow for limited offset breaks with orifice and short-nozzle data including Marviken

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SHORT Term Main Steamline break (sub compartments)

Q. If westinghouse generic methods are to be used they should be submitted for review

Long Term MSLB for Instrument Qualification Analysis

A. westinghouse outstanding will provide answers to staff questions on WCAP-8821 and 8822 for TYPE 51 and TYPE D steam generators and will Provide justification for use of method for TYPE F steam generators used by Carroll county.

Attachment B

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POOR ORIGINAL

5

Question on qualification of Class 1E Equipment

3.9.3.3
3.11.3)

The (plant) must meet the conditions of General Design Criteria 1, 2, 4 and 23 of Appendix A and Sections III and XI of Appendix B (to 10 CFR Part 50) and the national standards identified in Part II "Acceptance Criteria," of Standard Review Plan Section 3.11 (which includes IEEE Std 323). To meet these conditions, we require that the following detailed information about all Class 1E equipment.

(1) Identify all Class 1E equipment and provide the following information:

(a) Type (functional designation)
(b) Manufacturer
(c) Manufacturer's type number and model number
(d) The equipment should include the following, as applicable:
(I) Logic equipment
(II) Sensors (Pressure, differential pressure temperature)
(III) Control Boards
(IV) Instrument racks and panels
(V) Connectors
(VI) Electrical penetrations
(VII) Splices
(VIII) Terminal blocks

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(2) Categorize the equipment identified in (1) above into one of the following groups:

(a) Equipment that will experience the environmental conditions of design basis accidents and will be required to mitigate such accidents, and that will be qualified to function in the accident environment for the time required for accident mitigation with safety margin to failure.

will not be required to mitigate such

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accidents, but through which it must not fail in a manner detrimental to plant safety or accident mitigation, and that it is required to withstand any accident environment for the time during which it must not fail with safety margin to failure.

(c) Equipment that will experience environmental conditions of design basis accidents but will not be required to mitigate said accidents, whose failure (in any mode) is considered to not be detrimental to plant safety or accident mitigation, and that will need not be qualified for any accident environment, but will be qualified for its non-accident service environment.

(d) Equipment that will not experience environmental conditions of design basis accidents but will be qualified demonstrate operability under its normal or abnormal service environment. This equipment would normally be located outside of the reactor containment.

(3) For each type of equipment in the categories listed in (2) above provide separate design specification requirements, including:

(a) The system safety requirements.

(b) An environmental envelope as a function of time that includes all extreme parameters, both maximum and minimum values, expected to occur during plant shutdown, normal operation, abnormal operation, and any design basis event (including LOCA and MSLB), and post event conditions.

(c) Time required to fulfill its safety function when subjected to any of the extremes of the environmental envelope specified in 3(b) above.

(d) Technical bases should be provided to justify the placement of each type of equipment in categories 2(b) and 2(c) listed above.

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(4) Provide the qualification test plan, test setup, test procedures, and acceptance criteria for at least one of each group of equipment in 1(d) as appropriate to the category identified in (2) above. If any method other than type testing was used for qualification (operating experience, analysis, combined qualification, or augmented qualification), describe that method in sufficient detail to permit an evaluation

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of its adequacy.

(5) For each category of equipment identified in (2) above, state the actual qualification envelope simulated during testing (stating the duration of the hostile environment and the margin in excess of the design requirements). If any method other than type testing was used for qualification, identify the method and define the equivalent "qualification envelope" so derived.

(*6) Provide a summary of test results that demonstrates the adequacy of the qualification program. If analysis is used for qualification, justify all analysis assumptions.

(*7) Identify the qualification documents which contain detailed supporting information, including test data, for items (4), (5) and (6) above.

In addition, to meet the requirements of Appendix A of 10 CFR 50, the staff requires a statement verifying, (1) that all Class 1E equipment has been (QL) or will be (CP) qualified to the program described above, and (2) that the detailed qualification information and test results are (or will be) available for NRC audit.

* For applications for construction permits, it is acceptable to state that items 6 and 7 will be supplied in the initial application for an operating license.

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Environmental Control and Qualification Outside Containment

Some plant areas that contain safety related equipment depend on the continuous operation of environmental control systems to maintain the environment in those areas within the range of environmental qualification of the safety related equipment installed in those areas.

It is necessary to either determine extreme environmental conditions that can occur when the control equipment is shutdown and qualify the safety related equipment for these extremes; or to specify that these environmental control systems will operate to continuously maintain the environmental conditions within the qualified limits of the safety related equipment and provide environmental monitoring equipment that will alarm when the environmental conditions exceed those for which the equipment is qualified.

Therefore, the Staff position for the area is as follows:

Class 1E Equipment Qualification (Outside Containment)

With regard to all Class 1E equipment located outside the containment building, we require assurance that the environment is maintained within the temperature range for which the equipment is qualified to operate. In those locations where the temperature could exceed that for which the Class 1E equipment is qualified, the Staff requires that the applicant provide a temperature monitoring system. The system should at a minimum meet the following requirements:

a. The control room should receive an alarm when the temperature range has been exceeded. This alarm should be provided by instrumentation which

   1. is of high quality

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2. is checked to verify its functional capability by plant technical specification requirements, and
3. is powered from a continuous power source or is redundant with separate channels and power sources.

b. The operator should have a method of maintaining a continuous record of the temperature during the time that the temperature range is exceeded.

Based on the monitoring system the applicant shall report the occurrence of the temperature exceeding the equipment qualification range as an abnormal occurrence to the NRC. In addition to this, the applicant shall provide results of an analysis to demonstrate that the excess temperature has not degraded the involved Class 1E equipment below an acceptable level for continued plant operation.

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