Metzger, Brian

From: Sullivan, Kenneth [ks@bnl.gov] , BNL
Sent: Thursday, July 22, 2010 3:26 PM
To: Frumkin, Daniel; Metzger, Brian , NRR
Cc: Sullivan, Kenneth
Subject: Revised OC TERs
Attachments: Ph2 OC R12_72210.doc; OCPh1 Final DRAFT R1_72210.doc

Dan / Brian

As I stated this am....Attached are revised versions of the OC Ph 1 and Ph 2 TERs ...They were revised to more closely agree with the "Final" version of the Peach Bottom SE

Ken

B-4

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July 21, 2010

Mr. Daniel Frumkin
U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Risk Assessment, Fire Protection Branch (NRR/DRA / AFPB)
Washington, DC 20555-0001

Reference: JCN No. J-4242, Task Order No. 1, Exelon Generation Company, Oyster Creek Nuclear Generating Station TAC No. ME0756. – Phase 2 Request - OMAs Not Previously Identified In Fire Protection SERs.

Dear Mr. Frumkin:

By letter to the Nuclear Regulatory Commission (NRC) dated March 4 2009, Exelon Generation Company, LLC (the licensee), submitted a Request for Exemption from Title 10 of the Code of Federal Regulations, Part 50, Section III.G, "Fire Protection of Safe Shutdown Capability," for Oyster Creek Nuclear Generating station to allow the use of manual actions for demonstrating compliance with Section III.G.2 of Appendix R, which were not previously approved in Fire Protection Safety Evaluations issued by the staff. In accordance with the scope of work described in Task 1 of Project J-4242, I have reviewed the technical merit of the request submitted by the licensee.

As described in the enclosure, I recommend that the requested exemption be granted.

Per your request, the format and level of detail of this Technical Evaluation Report (TER) is similar to that used by the staff in its evaluation of Exelon Generating Company's exemption request to allow the use of operator manual actions (OMAs) at Peach Bottom Atomic Power Station Units 2 and 3 (TAC Nos. MD7029 AND MD7030).

If you have any questions, please contact me at the phone number or e-mail address indicated above.

Sincerely,

Kenneth Sullivan,
Systems Engineering and Safety Analysis Group

cc: B. Grenier, NRC
D. Diamond
J. Higgins
Project File J4242A, Task 1

ENCLOSURE

EXELON GENERATION COMPANY, LLC,

OYSTER CREEK NUCLEAR GENERATING STATION

DOCKET NO. 50-2 19

EXEMPTION

1.0 BACKGROUND

The Exelon Generation Company, LLC (Exelon, the licensee in addition to PSEG Nuclear, LLC) is the holder of Facility Operating License Nos. DPR-16 which authorizes the operation of the Oyster Creek Nuclear Generating Station. (OCNGS). The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC, the Commission) now or hereafter in effect.

The facility consists of a is a single unit Mark 1, General Electric (GE) 2, boiling water reactor (BWR) located in Ocean County, New Jersey.

2.0 REQUEST/ACTION

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.48, requires that nuclear power plants that were licensed before January 1, 1979, satisfy the requirements of 10 CFR Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," Section III.G, "Fire protection of safe shutdown capability." OCNGS was licensed to operate prior to January 1, 1979. As such, the licensee's Fire Protection Program (FPP) must provide the established level of protection as intended by 10 CFR Part 50, Appendix R, and Section III.G.

By letter dated, March 4, 2009 "Request for Exemption from 10 CFR 50, Appendix R, Section III.G, "Fire Protection of Safe Shutdown Capability (Phase 2)" (Agencywide Documents Access and Management System (ADAMS Accession No. ML090640225), Exelon requested an exemption for the Oyster Creek Nuclear Generating Station (OCNGS) to allow the use of operator manual actions (OMA) in lieu of meeting the requirements of Section III.G.2 of Appendix R to 10CFR50.

As described in Regulatory Issue Summary 2006-10, "Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions," for plants licensed before January 1, 1979, an approved exemption is required for all operator manual actions (OMAs) used to achieve compliance with 10 CFR Part 50, Appendix R Section III.G.2, even those that were accepted in a previously-issued NRC Safety Evaluation Report (SER). This exemption request (Phase 2) is limited to those manual actions that were not previously reviewed by the staff or included in the licensee's previous (Phase 1) exemption request, dated March 3, 2009.

In response to the staff's request for additional information, the licensee provided supplemental information dated April 2, 2010. In response to RAI-01.2, Exelon states that it has re-evaluated its exemption request, and, based on the results of this review, has withdrawn the following fire areas/zones from the request: RB-FZ-1F2, RB-FZ-1F4, RB-FZ-1H, TB-FA-3B,

OB-FZ-10B, TB-FZ-11A, TB-FZ-11G, AB-FA-13, DG-FA-15, NR-FA-20, OG-FA-21, OR-FA-19. As a result, the scope of the licensee's Phase 2 exemption request is limited to a total of 8 specific OMAs that may be required to be performed as a result of fire in the following 21 fire areas/ zones: CW-FA-14, OB-FA-9, OB-FZ-6A , OB-FZ-6B, OB-FZ-8A, OB-FZ-8B, OB-FZ-8C, OB-FZ-10A, RB-FZ-1D, RB-FZ-1E, RB-FZ-1F3, RB-FZ-1F5, RB-FZ-1G, TB-FA-3A, TB-FA-26, TB-FZ-11B, TB-FZ-11C, TB-FZ-11D, TB-FZ-11E, TB-FZ-11F, and TB-FZ-11H. The largest number of actions required to be performed as a result of fire in any single location (fire area or zone) is six (6). The 21 fire areas / zones and the thirteen specific OMAs to be performed in the event of fire in each area are described below in Table 1.

In summary, by letter dated March 4, 2009, and a supplemental letter dated April 2, 2010, responding to the NRC staff's request for additional information, Exelon submitted a request for exemption from 10 CFR Part 50, Appendix R, Section III.G, "Fire Protection of Safe Shutdown Capability," to permit the use of a total of 8 operator manual actions (OMA) in the event of fire in 21 separate fire areas / zones of the OCNGS.

3.0 DISCUSSION

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when: (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) one of the special circumstances provided in sub-paragraphs (i) through (vi) of 10 CFR 50.12(a) (2) is present.

Exelon states that it had originally intended to address the special circumstances provided in both 10 CFR 50.12(a) (2) (ii) [underlying purpose of the rule] and 10 CFR 50.12(a) (2) (iii) [undue hardship]. However, in its April 2, 2010 response to RAI-01.2, Exelon states that it no longer cites 10 CFR 50.12(a)(2)(iii) [undue hardship] as a special circumstance under 10 CFR 50.12(a)(2). In its response, Exelon states that the combination of defense-in-depth and the feasibility and reliability of the OMAs, demonstrates that the underlying purpose of the rule is met. Consistent with the language included in 10 CFR 50.12(a) (2) (ii).

In accordance with 10 CFR 50.48(b), nuclear power plants licensed before January 1, 1979, are required to meet Section III.G, of 10 CFR Part 50, Appendix R. The underlying purpose of 10 CFR Part 50, Appendix R, and Section III.G is to ensure that the ability to achieve and maintain safe shutdown is preserved following a fire event. The regulation intends for licensees to accomplish this by extending the concept of defense-in-depth to:

1) prevent fires from starting

2) rapidly detect, control, and extinguish promptly those fires that do occur

3) provide protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant.

The stated purpose of 10 CFR Part 50, Appendix R, Section III.G.2 (III.G.2) is to ensure that one of the redundant trains necessary to achieve and maintain hot shutdown conditions remains free of fire damage in the event of a fire. III.G.2 requires one of the following means to ensure that a redundant train of safe shutdown cables and equipment is free of fire damage, where redundant trains are located in the same fire area outside of primary containment:

a. Separation of cables and equipment by a fire barrier having a 3-hour rating;

b. Separation of cables and equipment by a horizontal distance of more that 20 feet with no intervening combustibles or fire hazards and with fire detectors and an automatic fire suppression system installed in the fire area; or

c. Enclosure of cables and equipment of one redundant train in a fire barrier having a 1-hour rating and with fire detectors and an automatic fire suppression system installed in the fire area.

In its March 3, 2009 and April 4, 2010 submittals, Exelon has requested an exemption from the requirements of III.G.2 for OCNGS to the extent that one of the redundant trains of systems necessary to achieve and maintain hot shutdown is not maintained free of fire damage in accordance with one of the required means specified above for a fire occurring in the following 22 Fire Areas or Zones:

1.	CW-FA-14	Circulatory Water Intake
2.	OB-FA-9	Office Building
3.	OB-FZ-6A	'A' 480V SWGR Rm.
4.	OB-FZ-6B	'B' 480V SWGR Rm.
5.	OB-FZ-8A	Reactor Recirculation MG Set Room
6.	OB-FZ-8B	Mechanical Equipment Room (35' elevation)
7.	OB-FZ-8C	A/B Battery Room, Tunnel and Electrical Tray Room
8.	OB-FZ-10A	Monitor and Change Room Area and Operations Support Area
9.	RB-FZ-1D	Reactor Building elevation 51'-3".
10.	RB-FZ-1E	Reactor Building elevation 23'-6"
11.	RB-FZ-1F3	Reactor Building basement –19'-6" elevation (Northwest corner)
12.	RB-FZ-1F5	Reactor Building basement –19'-6" elevation (Torus room - remaining area of Reactor
13.	RB-FZ-1G	Shutdown Cooling Room - north side of the Reactor Building (elevations 38' and 51'-3")
14.	TB-FA-3A	4160V Emergency Switchgear 1C Vault - Turbine Building Mezzanine 23'-6" elevation - south side
15.	TB-FA-26	125 VDC Battery Room 'C' - Turbine Building Mezzanine 23'-6" elevation - south side

16.	TB-FZ-11B	Turbine Lube Oil Storage, Pumping & Purification Area - Turbine Building, elevations 0'-0", 27'-0, 36'-0, and 46'-6"- north side
17.	TB-FZ-11C	4160V Switchgear Room 1A and 1B -Turbine Building Mezzanine 23'-6" elevation - west side
18.	TB-FZ-11D	Turbine Building Basement Floor - elevation 3'-6" - south side
19.	TB-FZ-11E	Condenser Bay - Turbine Building elevation 0'-0"
20.	TB-FZ-11F	Feedwater Pump Room - Turbine Building Basement elevation 3'6" - east side
21.	TB-FZ-11H	Demineralizer Tank and Steam Jet Air Ejector Area, Turbine Building 3'-6" and 23'-6" elevations - southeast side
22.	YARD	Includes the Office Building Roof, Turbine Building Roof and All remaining outside areas within the protected area not analyzed under other existing fire areas/zones

In its March 4, 2009 submittal, Exelon has requested an exemption from the requirements of III.G.2 for OCNGS to the extent that one of the redundant trains of systems necessary to achieve and maintain hot shutdown is not maintained free of fire damage in accordance with one of the required means specified above. Exelon states that the OMAs identified in the March 4, 2009 (Phase 2) request are new actions not previously accepted by the staff in a safety evaluation report.

Each OMA included in this review consists of a sequence of tasks that occur in various fire areas and zones identified above. As discussed below, the OMAs are initiated upon confirmation of a fire in a particular fire area. Listed in the order of the area of fire origin, the OMAs included in this Phase 1 review are as follows:

Area of Fire Origin	Actions
CW-FA-14	Manually open V-9-2099 and V-11-49 and close V-11-63 and V-11-41
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
OB-FA-9	Locally read Condensate Storage Tank level at LI-424-993 due to damage to control circuits.
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
OB-FZ-6A	Locally read CST level at LI-424-993 due to damage to control circuits.

Area of Fire Origin	**Actions**
	Use Remote Shutdown Panel to control equipment: RSP, CRD Hydraulic PP NC08B and 480V USS 1B2 Incoming breaker (Operate USS 1B2/CRD Transfer Switch (Partial initiation) to "Alternate" and operate Control Switches for USS-1B2 Main Breaker and B CRD Pump).
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
OB-FZ-6B	Manually open V-9-2099 and V-11-49 and close V-11-63 and V-11-41
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
OB-FZ-8A	Manually open V-9-2099 and V-11-49 and close V-11-63 and V-11-41
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
OB-FZ-8B	Manually open V-9-2099 and V-11-49 and close V-11-63 and V-11-41
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
OB-FZ-8C	Locally read Condensate Storage Tank level at LI-424-993 due to damage to control circuits.
	Manually open V-9-2099 and V-11-49 and close V-11-63 and V-11-41
	Use Local Shutdown Panels to control equipment as follows: LSP-1A2, CRD Hydraulic PP NC08A and 480V USS 1A2 Incoming breaker (Operate transfer switch "Alternate" and operate Control Switch for USS-1A2 Main Breaker 1A2M and A CRD Pump)
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
	Trip all five Reactor Recirculation Pumps (NG01-A, NG01-B, NG01-C, NG01D and NG01E). Also, lockout the 4160V breakers using the 69 Switch
OB-FZ-10A	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
RB-FZ-1D	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
RB-FZ-1E	Read CRD local flow gauge FI-225-998.
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
RB-FZ-1F3	Open Core Spray System II manual valves V-20-1 and V-20-2 and close V-20-4
RB-FZ-1F5	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
RB-FZ-1G	Read CRD local flow gauge FI-225-998.
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
TB-FA-3A	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
	Connect H.P. air cylinder to drain port of accumulator to recharge

Area of Fire Origin	**Actions**
TB-FA-26	Manually trip 4160V 1D Breakers and control USS 1B2 and 1B3 480V Breakers locally at LSP-1D
	Manually control 1B3M Breaker from LSP-1B3.
	Manually re-close MCC 1B32 Feeder Breaker at USS 1B3
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
TB-FZ-11B	Manually trip 4160V 1D Breakers and control USS 1B2 and 1B3 480V Breakers locally at LSP-1D
	Locally read Condensate Storage Tank level at LI-424-993
	Manually control 1B3M Breaker from LSP-1B3.
	Local Shutdown Panels used to control equipment as follows: LSP-1B32 Condensate Transfer Pump 1-2 (Operate transfer switch to "Alternate" and operate Control Switch for Condensate Transfer Pump 1-2)
	Manually re-close MCC 1B32 Feeder Breaker at USS 1B3
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
	Trip all five Reactor Recirculation Pumps (NG01-A), NG01-B, NG01-C, NG01D and NG01E). Also, lockout the 4160V breakers using the 69 Switch
TB-FZ-11C	Manually trip 4160V 1D Breakers and control USS 1B2 and 1B3 480V Breakers locally at LSP-1D
	Manually control 1B3M Breaker from LSP-1B3.
	Manually re-close MCC 1B32 Feeder Breaker at USS 1B3
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
TB-FZ-11D	Manually trip 4160V 1D Breakers and control USS 1B2 and 1B3 480VBreakers locally at LSP-1D
	Manually control 1B3M Breaker from LSP-1B3.
	Local Shutdown Panels are used to control equipment as follows: LSP-DG2, EDG2 and its Switchgear (Operate transfer Switches (3 total) to "Alternate" and operate Control Switch on Diesel Panel to start diesel)
	Manually re-close MCC 1B32 Feeder Breaker at USS 1B3
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
TB-FZ-11E	Manually trip 4160V 1D Breakers and control USS 1B2 and 1B3 480V Breakers locally at LSP-1D
	Locally read Condensate Storage Tank level at LI-424-993
	Manually control 1B3M Breaker from LSP-1B3.
	Local Shutdown Panels used to control equipment as follows: LSP-1B32 Condensate Transfer Pump 1-2 (Operate transfer switch to "Alternate" and operate Control Switch for Condensate Transfer Pump 1-2)
	Local Shutdown Panels are used to control equipment as follows: LSP-DG2, EDG2 and its Switchgear (Operate transfer Switches (3 total) to "Alternate" and operate Control Switch on Diesel Panel to start diesel)

Area of Fire Origin	Actions
	Manually re-close MCC 1B32 Feeder Breaker at USS 1B3
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
	Trip all five Reactor Recirculation Pumps (NG01-A, NG01-B, NG01-C, NG01D and NG01E) Also, lockout the 4160V breakers using the 69 Switch.
TB-FZ-11F	Manually open V-9-2099 and V-11-49 and close V-11-63 and V-11-41
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
TB-FZ-11H	Manually open V-9-2099 and V-11-49 and close V-11-63 and V-11-41
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
YARD	Align the CRD valves (V-15-30, V-15-52 and V-15-237) while monitoring the local flow indicator (FI-225-2)
	Connect H.P. air cylinder to drain port of accumulator to recharge

Exelon further states that the exemptions are being requested from the requirements of Section III.G.2 and are not part of a methodology to shutdown the plant from outside the control room. The areas identified in the exemption requests have been considered III.G.2 since the initial Appendix R submittal. Each of the OMAs is taken to permit shutdown of the plant from the control room. The specific requirements of III.G.2 that are not met are identified for each of the requested exemptions in Attachment 1 of the licensee's April 2, 2010 response.

In response to RAI-01.1 Exelon states that its proposed methodology achieves the underlying purpose of the rule by accomplishing the following:

1) OMAs identified in the March 4, 2009 (Phase 2) request are both feasible and reliable and not impacted by environmental conditions associated with fires in Appendix R, Section III.G.2 areas.

2) the equipment needed to implement OMAs remains available and the fire areas remain accessible during or following the event.

3) the OMAs are directed by plant procedures, and the operators are trained in the use of the procedures.

4) staffing is adequate to perform the OMAs.

5) walkdowns and demonstrations have shown that adequate time is available to perform the OMAs, and

6) time margin is available to account for uncertainties that may arise during a fire event.

7) the requested OMAs are similar to activities performed by plant operators as part of their normal work assignments

8) adherence to the principles of fire protection defense-in-depth.

To address staff concerns regarding the adequacy of defense-in-depth provided for each of the fire areas / zones included in its requests, Exelon developed a Fire Hazards Analysis (FHA) which was included as Attachment 2 of its April 2, 2010 response. For each of the areas / zones included in the request, Exelon states that the fire protection configuration provided achieves a level of protection commensurate with that intended by Appendix R, Section III.G.2. For each fire area / zone, the FHA describes the physical location and arrangement of equipment, combustible loading, ignition sources, fire protection features, and proximity of redundant safe shutdown equipment to in situ hazards and identifies deviations from fire protection codes and previously approved exemptions.

In the March 4, 2009 request, the licensee outlined the approach that was taken to evaluate and assess the effectiveness of the operator manual actions included in the request and explains where each operator manual action is located and the role of the actions in achieving safe shutdown. In its April 2, 2010 response to a Request for Additional Information the licensee provides a discussion and justification for why the operator manual actions are appropriate for maintaining consistency with the intent of Section III.G.2 of Appendix R. The NRC staff reviewed the licensee's evaluation in support of the subject exemption request for the use of operator manual actions in lieu of the requirements specified in Section III.G.2 of Appendix R, and concluded that given the existing fire protection features in the affected fire zones, Exelon continues to meet the underlying purpose of 10 CFR Part 50, Appendix R, Section III.G.2 for the OCNGS fire areas described in Attachment 1 The following technical evaluation provides the basis for this conclusion.

3.1 Fire Prevention

In response to staff requests for additional information Exelon developed a Fire Hazards Analysis (FHA) for each fire area / zone identified in its exemption request. For each fire area / zone, the FHA describes the physical location and arrangement of equipment, combustible loading, ignition sources, fire protection features, and proximity of redundant safe shutdown equipment to in situ hazards and identifies deviations from fire protection codes and previously approved exemptions. In addition, for each fire area/zone the licensee's response includes a tabulation of potential ignition sources as well as the equipment that may exhibit high energy arcing faults. For each fire area / zone, the FHA states that the fire protection configuration achieves a level of protection commensurate with that intended by Appendix R, Section III.G.2

All 22 areas / zones identified in the request have limited or low combustible fuel loading (equivalent fire severity of less than 45 minutes) except areas OB-FZ-6A, OB-FZ-6B, and TB-FZ-11B. Fire areas OB-FZ-6A and OB-FZ-6B, have low to moderate combustible fuel loading (equivalent fire severity of less than 105 minutes) and TB-FZ-11B has a high combustible fuel loading (equivalent fire severity of greater than 105 minutes). Areas with moderate or greater fuel loading have adequate detection and suppression systems appropriate for the hazard.

The fire areas included in the exemption are not shop areas so hot work activities are infrequent with administrative controls (e.g., hot work permits, fire watch, and supervisory controls) programs in place if hot work activities do occur. The administrative controls are described in the OCNGS Fire Protection Program (FPP), which is incorporated into the Updated Final Safety Analysis Report.

Unless noted otherwise below, all of the fire areas included in this exemption have a combustible fuel load that is considered to be low with fuel sources consisting primarily of fire retardant cable insulation and limited floor based combustibles. Unless noted otherwise, there are no high energy ignition sources located in the areas and the areas.

Fire Area	Combustible Loading
CW-FA-14	Fire Area CW-FA-14 is an outdoor structure with no walls or ceiling. This fire area consists of a structure that is remote from the power block and other outdoor equipment (e.g., main transformers, etc.) that is open to the environment. Combustible loading consists of transformer liquid and electrical motors although it is not quantified because there is nothing to contain the heat release in the event of a fire. The main combustible in this area that could result in the need for the OMAs is Dow Corning 561 Silicon transformer liquid. The licensee states that the transformer liquid has characteristics that minimize the likelihood of a fire involving the insulating liquid itself
OB-FA-9	This area has an administrative fire loading limit of less than 1.5 hours as determined by the ASTM E119 time-temperature curve. The major combustibles in the MUX Corridor are cable insulation and a wood ceiling on top of the MUX enclosure.
OB-FZ-6A	Fire loading in this fire zone is moderate. This area has an administrative fire loading limit of less than three-hours as determined by the ASTM E119 time-temperature curve. The main combustibles in this area are cable insulation (approximately 81% of loading) and Dow Corning 561 Silicon transformer liquid (approximately 15% of loading). The transformer liquid has characteristics that minimize the likelihood of a fire involving the insulating liquid itself.
OB-FZ-6B	Fire loading in this fire zone is moderate. Fire Zone OB-FZ-6B floor area is approximately 679 sq. ft. This area has an administrative fire loading limit of less than two hours as determined by the ASTM E119 time-temperature curve. The main combustibles in this area are cable insulation (approximately 28% of loading), Thermo-Lag (approximately 29% of loading) and Dow Corning 561 Silicon transformer liquid (approximately 31% of loading). The transformer liquid has characteristics that minimize the likelihood of a fire involving the insulating liquid itself
OB-FZ-8A OB-FZ-8B	Fire Zones OB-FZ-8A and 8B are evaluated together for the combustible loading and FSSD analysis. These fire zones have an administrative fire loading limit of less than 45 minutes as determined by the ASTM E119 time-temperature curve. There are very minimal combustibles in Fire Zone OB-FZ-8B. The major combustibles in Fire Zone OB-FZ-8A are lubricating oil (approximately 83% of loading) and cable insulation (approximately 13% of loading).
OB-FZ-8C	This area has an administrative fire loading limit of less than 1.5 hours as determined by the ASTM E119 time-temperature curve. The main combustibles in this area are the plastic battery cases and racks (approximately 56% of loading) and cable insulation (approximately 39% of loading).
OB-FZ-10A	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. This limit is tied to an NRC-accepted approach for dealing with fire zone boundaries (refer to the response to

Fire Area	Combustible Loading
	RAI-04.3 in Attachment 1 for more details). The major combustibles in this area are cable insulation (approximate 27% of loading), rubber flooring (approximately 31% of loading), miscellaneous plastics (approximately 17% of loading) and Protective Clothing (PC) supplies (approximately 20% of loading). However, since the PCs have been placed in metal cans with self-closing lids they are no longer considered a contribution to the combustibles in this area.
RB-FZ-1D	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The main combustible in this area is attributed to cable insulation (approximately 84% of loading).
RB-FZ-1E	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The main combustible in this area is attributed to cable insulation (approximately 84% of loading).
RB-FZ-1F3	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The major combustibles in this area are cable insulation (approximately 58% of loading), ladders (approximately 16% of loading) and lubricating oil in pumps (approximately 16% of loading).
RB-FZ-1F5	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The major combustibles in this area are cable insulation (approximately 19% of loading) and gratings (approximately 76% of loading). The grating, which is the largest plastic material in this area, has a flame spread of less than 25.
RB-FZ-1G	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The main combustibles in this area are cable insulation (approximately 12% of loading), plastic (approximately 57% of loading) and Class A combustibles (approximately 14% of loading). The grating, which is the majority of the plastic material in this area, has a flame spread of less than 25.
TB-FA-3A	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. There are minimal amounts of cable insulation (approximately 5% of loading) miscellaneous plastic (approximately 73% of loading) and class A combustibles such as paper for procedures (approximately 20% of loading) in this area.
TB-FA-26	This area requires an administrative fire loading limit of less than 90 minutes as determined by the ASTM E119 time-temperature curve. The major combustibles in this area are plastic, which is contributed by the battery cases (approximately 92% of loading) and cable insulation (approximately 6% of loading).
TB-FZ-11B	This fire zone has administrative controls such that additional combustible materials are not introduced into this zone and defense-in-depth features to control a potential oil fire in this zone The major combustibles in this area are lubricating oil (approximately 99% of loading) and cable insulation (approximately 0.3% of

Fire Area	Combustible Loading
	loading). The amount of oil contained in the lube oil storage tanks in this fire zone drives the combustible loading in this fire zone to approximately 14 hours.
TB-FZ-11C	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The main combustible loading is attributed to cable insulation (approximately 73% of loading) and plastic (approximately 17% of loading).
TB-FZ-11D	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The major combustibles in this area are cable insulation (approximately 29% of loading), Dow Corning 561 Silicon transformer liquid (approximately 15% of loading) and lubricating oil (approximately 40% of loading).
TB-FZ-11E	This Fire Zone (Condenser Bay) is procedurally controlled as a transient combustible free area in procedure OP-AA-201-009 while the plant is operating. This area is a high radiation area during plant operation and is not normally accessed. The area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The major combustibles in this area are cable insulation (approximately 40% of loading) and plastic (approximately 59% of loading). The grating, which is the largest plastic material in this area, is dispersed throughout this fire zone (not concentrated) and has a flame spread of less than 25.
TB-FZ-11F	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The major combustible load consists of cable insulation (approximately 15% of loading), lubricating oil (approximately 39% of loading), rubber (approximately 21% of loading) and plastics (approximately 17% of loading). The licensee states that the majority of the combustible loading attributed to rubber and plastic was due to the storage of hoses which are now no longer in the area.
TB-FZ-11H	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The major combustibles are cable insulation (approximately 23% of loading), ladders and other miscellaneous plastics (approximately 55% of loading) and miscellaneous ordinary combustibles.
YARD	This is an outdoor area. There is no ceiling and no physical boundaries, and therefore, no fire rated or non-fire rated assemblies. There is no fire detection, however, there is constant observation of the site (yard area), both by humans and electronic devices (cameras). Manual suppression is provided by a hose station from the office building and by fire hydrants located throughout the yard area. significant hazards in this area (e.g., SBO transformer, etc.).are protected by a suppression system.

The NRC staff finds that for all of the areas related to this exemption, the level of fire protection combined with the limited fuel load and minimal ignition sources in the fire areas associated with this exemption results in a low likelihood of a fire occurring and spreading to adjacent fire areas or equipment.

3.2 Detection, Control and Extinguishment

The NRC staff evaluated the fire detection, control and suppression systems associated with the areas related to this exemption. All fire areas included in this exemption have automatic detection systems installed except Fire Zones TB-FZ-11D, TB-FZ-11E, CW-FA-14, and the Yard Area.

For Fire Zone TB-FZ-11D, an exemption was granted from the requirements of Appendix R Section III.G.2 in SERs dated March 24, 1986 and June 25, 1990 for not having area-wide automatic fire detection and suppression system. The primary basis for this exemption is the presence of the automatic wet pipe sprinkler system, low fire loading and the one-hour barrier protection for safe shutdown circuits. Also, the flow alarm will notify the control room of any sprinkler system activation. Since a fire in this area would not impede the plant's capability for safe shutdown, this exemption does not impact the basis for the manual exemption request.

The lack of a fixed fire detection capability in Fire Zone TB-FZ-11E was addressed by the staff in an exemption granted by the staff in SERs dated March 24, 1986 and June 25, 1990. The primary basis for this exemption is the presence of the automatic wet pipe sprinkler system and low fire loading. Since a fire in this area would not impede the plant's capability for safe shutdown, this exemption does not impact the basis for the manual exemption request.

Fire Area CW-FA-14, Circulatory Water Intake, is an outside area greater than 100 feet from any building except for the fish sample pool enclosure which is constructed of non-combustible material. The lack of automatic detection is compensated for by continuous monitoring of the area by security personnel located in a nearby tower. The licensee further states that numerous indications and symptoms would remain available in the Control Room to ensure that the need to perform the requested OMAs would be readily diagnosed.

Automatic fire detection systems are also not installed in outside locations classified as the Yard Area. However, since the area is under constant observation both by humans and electronic devices (cameras), a fire would be detected and appropriate actions taken without significant delay.

Fire areas OB-FA-9, OB-FZ-8A, RB-FZ-1F3, TB-FZ-11B, and TB-FZ-11H have partial area detection systems installed to address specific fire hazards. Fire Area OB-FA-9 consists of three floors of the Office Building. Detection which alarms locally and in the control room is provided in the main hallways and inside of a small area known as the MUX room enclosure. The licensee states that the majority of this fire area is normally traveled since it is the main path to the control room. However, the MUX corridor, which is adjacent to the south wall of the control room, is not a normally traveled area. Detection of a fire in the MUX corridor would be by the installed suppression system.

In Fire Area TB-FZ-11B, detection and suppression systems are installed to protect against the lube oil hazard in the area. Automatic detection is provided by a rate of rise/fixed temperature fire detection system at the lube oil tank. Locating the detectors in close proximity to tank provides for prompt detection of an oil fire, which in turn activates a deluge suppression system for extinguishment.

There is no area-wide detection system provided for Fire Zone OB-FZ-8A. Detection within OB-FZ-8A consists of a duct smoke detector located in the exhaust duct of fan EF-1-20. An exemption was granted from the requirements of Appendix R, Section III.G.2, for not providing area detection in this area. This exemption was approved in the NRC SER dated June 25, 1990 based on the fact that any fire which might occur in Fire Zone OB-FZ-8A will be relatively small and will be controlled by the automatic sprinkler system. Since operation of the sprinkler system will alarm in the control room, prompt notification of and response by, the fire brigade for any required manual fire fighting activities is expected. In addition, OB-FZ-8A is analyzed together with OB-FZ-8B for combustible loading and safe shutdown purposes and area-wide detection is provided in Fire Zone OB-FZ-8B which alarms locally and in the control room.

The detection capability provided for RB-FZ-1F3 consists of smoke detectors which alarm locally and in the control room, that are located in close proximity to the hazard (i.e., over pumps and cable tray. Since they are not mounted at the ceiling this is a deviation from NFPA 72E, 1974 Edition. The licensee states that an evaluation of this deviation has determined that positioning the detectors closer to the hazard improves the detectors' responsiveness to the major hazards in the area.

Fire Zone TB-FZ-11H also lacks area-wide detection coverage. For a fire in this fire zone the licensee states that the "A" train of power is credited and available since they are located outside of this fire zone. However, there are two "B" Train 125 VDC control power cables associated with the non-protected train routed in conduits which traverse through the stairway area of this zone at approximately elevation 10'. An OMA for utilizing fire water would be required if these conduits are affected by fire. In addition to installing a new fire detector in the stairwell area near these conduits the licensee states that no ignition sources are located in the portion of the Zone where the conduits are routed.

Fire areas OB-FZ-6A, OB-FZ-8C, OB-FZ-10A, TB-FA-3A, TB-FA-26, TB-FZ-11B TB-FZ-11C, TB-FZ-11D and TB-FZ-11E have area wide fire suppression systems installed to mitigate the specific fire hazards located in the area. Fire Areas OB-FZ-6A, the B Train Switchgear Portion of OB-FZ-6B and OB-FZ-8C are provided with total flooding Automatic Halon 1301 Systems. TB-FA-3A is provided with a manually actuated, total flooding, CO_2 system. OB-FZ-10A, TB-FA-26, TB-FZ-11B, TB-FZ-11C TB-FZ-11D and TB-FZ-11E have automatic sprinklers.

Fire Areas OB-FA-9, OB-FZ-8A, RB-FZ-1D, RB-FZ-1E have partial coverage suppression to suppress fires that may occur due to the specific hazard. Fire Area OB-FA-9 has closed head sprinkler systems that provide coverage of the MUX room corridor over the MUX enclosure and the MUX Enclosure. In addition, fire extinguishers and hose stations are provided for manual fire fighting. Fire Area OB-FZ-8A has partial automatic wet pipe sprinklers. An alarm will sound in the control room when the automatic fire suppression system operates. Fire loading in this fire zone is low, consisting primarily of lubricating oil and cable insulation. Safety related cable trays in Fire Zones RB-FZ-1D and RB-FZ-1E are protected by automatic fixed deluge water spray systems which are automatically activated by cross-zoned detection systems.

Fire Areas CW-FA-14, OB-FZ-8B, RB-FZ-1F3, RB-FZ-1F5, RB-FZ-1G, TB-FZ-11H and the Yard are protected by manual fire fighting capabilities.

Fire Area CW-FA-14 is an outdoor structure that is remote from the power block and other outdoor equipment (e.g., main transformers, etc.). Since the area is continuously monitored by security personnel located in a nearby tower, prompt notification of the station fire brigade is assured.

Fire Zone OB-FZ-8B has a small floor area (approximately 479 sq. ft) and the combustibles located in this Zone are very minimal. The major combustibles in Fire Zone OB-FZ-8A are lubricating oil (approximately 83% of loading) and cable insulation (approximately 13% of loading). There are no components or cables that will cause the loss of the "B" Train of Power in Fire Zone OB-FZ-8B. This area is accessed only through a single locked door with a vital access door lock so access into the room is restricted. There are no credible ignition sources in this room that would impact the credited cables located in conduit in the room below. Manual fire suppression consists of portable fire extinguishers with hose stations for backup.

Fire Zone RB-FZ-1F3 floor area is also small (approximately 560 sq. ft.) The major combustibles in this area are cable insulation (approximately 58% of loading), ladders (approximately 16% of loading) and lubricating oil in pumps (approximately 16% of loading). The fire loading in Fire Zones RB-FZ-1F3 and RB-FZ-1F5 is defined as "low" in the FHAR. Fixed combustibles are limited to molded fiberglass reinforced polyester grating and minor amounts of lube oil in the various pumps. Manual fire suppression consists of portable fire extinguishers with hose stations for backup. In a Safety Evaluation dated June 25, 1990 the staff approved an exemption for not having area-wide automatic fire suppression in fire zone RB-FZ-1F based on the low combustible loading and the fact that the fire detection would alert the fire brigade to the onset of a fire in the zone so that prompt manual suppression of any fire could be accomplished.

Fire Zone RB-FZ-1G is approximately 1609 sq. ft. The main combustibles in this area are cable insulation (approximately 12% of loading), plastic grating (approximately 57% of loading) and Class A combustibles (approximately 14% of loading). Manual fire suppression consists of portable fire extinguishers with hose stations for backup.

The major combustibles in TB-FZ-11H are cable insulation (approximately 23% of loading), ladders and other miscellaneous plastics (approximately 55% of loading) and miscellaneous ordinary combustibles. The fire loading is "low" as defined in the FHAR. No fire safe shutdown equipment is located in this area but there are two "B" Train 125 VDC control power cables (non-protected train) that traverse through the stairway area of this zone at approximately elevation 10 ft. Manual fire suppression consists of portable fire extinguishers with hose stations for backup.

The Yard Area is located outside. Combustible loading is spread throughout the yard but is not quantified because there is nothing to contain the heat release in the event of a fire. Significant hazards in this area (e.g., SBO transformer). are protected by a suppression system. In addition, The Yard Area is in constant observation both by humans and electronic devices (cameras), so that if a fire would occur, it would be detected and appropriate actions taken without significant delay. Manual suppression is provided by a hose station from the office building and by fire hydrants located throughout the yard area.

The NRC staff finds that the fire barriers, fire detection, control and suppression systems are adequate to mitigate and contain the fire hazards in the 21 areas identified in the licensee's request.

3.3 Preservation of Safe Shutdown Capability

The NRC staff has evaluated the feasibility and reliability review provided by the licensee in the April 2, 2010, Response to Request for Additional Information. A 'feasible action' is one that is analyzed and demonstrated as being able to be performed within an available time so as to avoid a defined undesirable outcome. The feasibility review documents that procedures are in place, in the form of fire response procedures, to ensure that clear and accessible instructions on how to perform the manual actions are available to the operators. A "reliable action" is a feasible action that is analyzed and demonstrated as being dependably repeatable within an available time, so as to avoid a defined adverse consequence, while considering varying conditions that could affect the available time and/or the time to perform the action. Thus, an action is considered reliable if the licensee's analysis demonstrates that there is adequate time available to account for uncertainties not only in estimates of the time available, but also in estimates of how long it takes to diagnose and execute the operator manual action (e.g., as based, at least in part, on a plant demonstration of the action under non-ire conditions).

To provide assurance that the requested OMAs can reliably be performed under a wide range of conceivable conditions by different plant crews, the licensee states that the feasibility and reliability of OMAs identified in the March 4, 2009 (Phase 2) exemption request were evaluated against the criteria contained in NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," dated October, 2007 which provides guidance acceptable to the staff for evaluating the feasibility and reliability of post-fire operator manual actions in nuclear power plants.

The licensee's analysis addresses factors such as environmental concerns, equipment functionality and accessibility, available indications, communications, portable equipment, personnel protection equipment, procedures and training, staffing and demonstrations. In their March 4, 2009 request and further supported by their April 2, 2010 response, the licensee stated that environmental considerations such as radiological concerns, emergency lighting, temperature and humidity conditions and smoke and toxic gases were evaluated and found to not represent a negative impact on the operators' abilities to complete the OMAs. The licensee has also stated that sufficient emergency lighting exists at the areas where the actions are performed and along the travel routes to the areas and that the noise levels at the areas where the actions are performed should not impede the use of normal communications.

All of the requested OMAs are directed by plant procedures, and the operators are trained in the use of the procedures. Specifically, procedure ABN-29, Plant Fires, is entered whenever a fire or indication of a fire occurs on the main fire alarm panel in the control room or at any local fire alarm panel. In addition to dispatching a radio-equipped operator to the alarming location, ABN-29 also directs that the fire brigade be dispatched whenever a fire suppression system has actuated (sprinkler, deluge, Halon, CO2) or a fire is confirmed. In addition, ABN-29 directs immediate entry into the Fire Support Procedure (FSP) for the affected fire area as soon as the existence of a fire is confirmed. The licensee states that the following indications or symptoms are considered examples of a confirmed fire:

- Fire detection alarm and equipment malfunction indication or alarms within the same area;

- Fire pump start and either sprinkler flow alarm or deluge flow alarm;
- Gaseous suppression system actuation;
- Report from the field of an actual smoke condition or actual fire condition.
- Fire detection alarm with follow up confirmation by field operator.

Entering the FSP means that the operator will review the FSP, identify equipment that could be affected, identify equipment that will be available, monitor plant equipment from the control room and communicate with the fire brigade leader. Based on the symptoms received in the control room and the feedback from the fire brigade leader, the operator will decide using the procedure what mitigating actions are necessary. In the event that a plant shutdown has occurred before the FSP is entered, the operator will still enter the FSP based on the fire and initiate the OMAs as appropriate. OMAs that are considered "prompt" (i.e., those that must be done within 45 minutes or less) are identified in both ABN-29 and in the applicable Fire Support Procedures as an item requiring immediate attention. The operators are trained to perform prompt actions first and prioritize them based upon existing plant conditions. The FSPs are based on the worst-case loss considerations by assuming all fire damage occurs instantaneously and thus all operator manual actions will be required. The use of the Emergency Operating Procedures (EOPs) in conjunction with the applicable FSPs will permit the use of any mitigating system available first, and if a desired system is not available, the FSP provides a contingency action to restore the system or provide another means to perform the function. Operator training, including simulator demonstrations and plant walk downs, has been performed to ensure consistency in operator and team response for each OMA.

Each of the safe shutdown calculations that provide the technical basis for the FSPs contains a timeline for operator actions for the specific fire area. In addition, simulator exercises and walkdowns were performed to demonstrate that the operator manual actions can be performed reliably within the times allotted by the fire safe shutdown calculations. In its April 2, 2010 response the licensee states that the simulator demonstration proved that all of the OMAs for each fire zone could be accomplished as required.

For each of the fire areas included in this exemption, the postulated fire scenarios and pertinent details are summarized in Table 1 below.

The NRC staff reviewed the required operator manual action completion time limits versus the time before the action becomes critical to safely shutting down the unit as presented in the feasibility analyses. In one case the action must be completed within 30 minutes. This action, which is identified as OMA Phase 2, #1 requires an operator to manually trip the field breakers for recirculation pumps MG Set so that the fuel zone level indicators can be used. This action may be required as a result of fire in TB-FA-26, TB-FZ-11C, or TB-FZ-11D. The symptom for this action is the inability to trip the Recirculation Pumps from the control room and this is detected using the associated pump breaker indicating lights, alarms and flow indications. The Fire Support Procedures direct the operator to trip the pumps using the control switches or the Recirculation Pump Trip circuitry (two trip coils). If both of these methods fail on one or more pumps, the guidance is given to trip the pumps from locations outside the control room. Only one operator would be required and it would take approximately 8 minutes for access to the area and to perform the action. Given the low complexity of this action, the! \IRC staff finds that there is a sufficient amount of time available to complete the proposed operator manual actions.

3.4 Evaluation

As stated in 10 CFR Part 50, Appendix R, and Section 1/: The fire protection program shall extend the concept of defense-in-depth to fire protection with the following objectives:

1. To prevent fires from starting,
2. To detect rapidly, control, and extinguish promptly those fires that do occur, and
3. To provide protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant.

The NRC staff has evaluated the elements of defense-in-depth used for fire protection at OCNGS, applicable to the fire zones under review. Based upon consideration of the limited fire ignition sources and fire hazards in the affected areas, and the existing fire protection measures at OCNGS, the NRC staff concludes that objective one of defense-in-depth is adequately met.

Based on the evaluation of fire detection and suppression systems provided in the affected fire zones, the NRC staff determined that any postulated fire is expected to be promptly detected by the fire detection systems in the associated fire areas. The available fire detection and suppression equipment in these fire areas ensure that a postulated fire will not be left unchallenged. In addition, all fire areas are separated from adjacent fire areas by suitable fire-rated barriers to provide a level of compartmentalization between the fire areas and/or buildings. This compartmentalization helps to ensure that fires will not spread to adjacent fire areas and that any fire damage will be limited to the fire area of origin. In addition, when fires are contained in the fire area of origin, the licensee has demonstrated that the manual actions are feasible. Therefore, the NRC staff concludes that objectives 2 and 3 of defense-in-depth are adequately met.

Therefore, the NRC staff concludes that the requested exemption to use operator manual actions in lieu of the requirements of 10 CFR Part 50, Appendix R, Section III.G.2 is consistent with the defense-in-depth methodology necessary at nuclear power plants and will not impact OCNGS post-fire safe-shutdown capability.

3.5 Authorized By Law

This exemption would allow OCNGS the use of operator manual actions in lieu of meeting the requirements specified in 10 CFR Part 50, Appendix R, and Section III.G.2. As stated above, 10 CFR 50.12 allows the NRC to grant exemptions from the requirements of 10 CFR Part 50. The NRC staff has determined that granting of the licensee's proposed exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations because special circumstances exist that warrant the use of the operator manual actions to achieve safe shutdown. Therefore, the exemption is authorized by law.

3.6 No Undue Risk To Public Health and Safety

The underlying purpose of 10 CFR Part 50, Appendix R, Section III.G.2 is to ensure that one of the redundant trains necessary to achieve and maintain hot shutdown conditions remains free of fire damage in the event of a fire. Based on the existing fire barriers, fire detectors, automatic and manual fire suppression equipment, fire protection requirements, and the absence of significant combustible loads and ignition sources in the fire areas associated with this exemption, the NRC staff has concluded that application of 10 CFR Part 50, Appendix R, Section III.G.2 for these fire areas is not necessary to achieve the underlying purpose of this regulation.

The NRC staff has determined that the exemption to allow OCNGS the use of operator manual actions in lieu of the requirements specified in 10 CFR Part 50, Appendix R, and Section III.G.2 does not increase the probability or consequences of previously evaluated accidents. This determination is based on the NRC staff finding that the operator manual actions are not the sole form of protection relied upon due to the other fire protection features in place and the manual actions are considered feasible and provide safe shutdown capability following a fire. The combination of the operator manual actions, in conjunction with all of the measures and systems discussed above, results in an adequate level of protection. No new accident initiators are created by allowing use of operator manual actions in the fire areas identified in the exemption and the probability of postulated accidents is not increased. Similarly, the consequences of postulated accidents are not increased. Therefore, there is no undue risk (since risk is probability multiplied by consequences) to public health and safety.

3.7 Consistent with Common Defense and Security

The proposed exemption would allow OCNGS the use of specific operator manual actions in lieu of meeting the requirements specified in 10 CFR Part 50, Appendix R, and Section III.G.2. This change, to the operation of the plant, has no relation to security issues nor does it diminish the level of safety from what was intended by the requirements contained in Section III.G.2. Therefore, the common defense and security is not impacted by this exemption.

3.8 Special Circumstances

One of the special circumstances described in 10 CFR 50.12(a) (2) (ii) is that the application of the regulation is not necessary to achieve the underlying purpose of the rule. The underlying purpose of 10 CFR Part 50, Appendix R, Section III.G.2 is to ensure that one of the redundant trains necessary to achieve and maintain hot shutdown conditions remains free of fire damage in the event of a fire. For the fire areas specified in Table 1 of this exemption, the NRC staff finds that the operator manual actions are feasible and the existing configuration described herein will ensure that a redundant train necessary to achieve and maintain safe shutdown of the plant will remain free of fire damage in the event of a fire in these fire zones. Since the underlying purpose of 10 CFR Part 50, Appendix R, Section III.G is achieved, the special circumstances required by 10 CFR 50.12(a)(2)(ii) for the granting of an exemption from 10 CFR Part 50, Appendix R, Section III.G.2 exist.

4.0 Conclusion

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Also, special circumstances are present such that application of the regulation in these particular circumstances is not necessary to achieve the underlying purpose of the rule. Therefore, the Commission hereby grants Exelon an exemption from the requirements of Section III.G.2 of Appendix R of 10 CFR Part 50, to

OCNGS for the 21 operator manual actions specified in Table 1.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment (74 FR 5191).

TABLE 1

Phase 2 OMAs

TABLE 1

Phase 2 OMAs

OMA Number	Purpose	Fire Affected Component	Initiating Fire Area	Actions	Action Location
1	Trip field breakers for recirculation pumps MG set so the fuel zone level indicators can be used	1A and 1B 4160V Switchgear Cabinets and the "C" Battery distribution panel.	TB-FA-26 TB-FZ-11C TB-FZ-11D	Trip Field Breakers for Recirculation Pumps A through E.	OB-FZ-8C
2	Provide makeup water to the "A' Isolation Condenser.	Control cables for 1D 4160V breakers; 1D Main breaker and USS 1B3 breaker.	TB-FA-26 TB-FZ-11C TB-FZ-11D	Manually manipulate valves V-9-2099, V-11-49, V-11-63 and V-11-41 to align Fire Water for makeup to Isolation Condenser.	RB-FZ-1E
3	Manually control 480V USS 1B2 Breakers for CRD Pump NC08B and 1B2M from Remote Shutdown Panel.	Control Cables for CRD Pump NC08B and 1B2M	TB-FA-26, TB-FZ-11B, TB-FZ-11C, TB-FZ-11D, TB-FZ-11E	Proceed to RSP operate transfer sw. & control CRD Pump B and bkr 1B2M to power USS-1B2	OB-FZ-6B
7	To provide makeup water to the 'A' Isolation Condenser	This is a contingency action if access to the 4160V Switchgear is delayed due to smoke and/or CO2, and the Condensate Transfer System is unavailable. Under these conditions, the safe shutdown analysis credits the fire water system to provide makeup water to the Isolation Condenser	TB-FA-26, TB-FZ-11C, TB-FZ-11D	Manually open V-11-36 to makeup to the Isolation Condenser	RB-FZ-1B

OMA Number	Purpose	Fire Affected Component	Initiating Fire Area	Actions	Action Location
8	Monitor Isolation Condenser level	This is a contingency action if access to the 4160V Switchgear is delayed due to smoke and/or CO2, and the Condensate Transfer System is unavailable. Under these conditions, the safe shutdown analysis credits the fire water system to provide makeup water to the Isolation Condenser	TB-FA-26, TB-FZ-11C, TB-FZ-11D	Obtain "A" Isolation Condenser shell level using local mechanical gauge	RB-FZ-1B
9	RPV Makeup	Instrument Air	YARD[1]	Align the CRD valves (V-15-30, V-15-52 and V-15-237) while monitoring the local flow indicator (FI-225-2)	RB-FZ-1E

[1] Yard Area Includes the Office Building Roof, Turbine Building Roof and All remaining outside areas within the protected area not analyzed under other existing fire areas/zones

OMA Number	Purpose	Fire Affected Component	Initiating Fire Area	Actions	Action Location
17	Ensure long-term control of V-11-34 and IC makeup	V-11-34	RB-FZ-1D, RB-FZ-1E, RB-FZ-1F3, RB-FZ-1F5, RB-FZ-1G, TB-FA-3A, OB-FZ-6A, OB-FZ-8A, OB-FZ-8B, OB-FZ-8C, OB-FA-9, CW-FA-14, YARD	Connect H.P. air cylinder to drain port of accumulator to recharge	RB-FZ-1B

OMA Number	Purpose	Fire Affected Component	Initiating Fire Area	Actions	Action Location
18	To ensure long-term control of V-11-36 and makeup to the Isolation Condensers.	V-11-36	OB-FZ-6B, TB-FA-26, TB-FZ-11B, TB-FZ-11C, TB-FZ-11D, TB-FZ-11E, TB-FZ-11F, TB-FZ-11H OB-FZ-10A	Connect H.P. air cylinder to drain port of accumulator to recharge	RB-FZ-1B

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Mr. Daniel Frumkin
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Washington, DC 20555-0001

Reference: JCN No. J-4242, Task Order No. 1, Exelon Generation Company, Oyster Creek Nuclear Generating Station TAC No. ME0756. – Phase 1 Request - Use of OMAs Previously Approved In Fire Protection SERs.

Dear Mr. Frumkin:

By letters to the Nuclear Regulatory Commission (NRC) dated March 3, 2009, Exelon Generation Company, LLC (the licensee), submitted a Request for Exemption from Title 10 of the Code of Federal Regulations, Part 50, Section III.G, "Fire Protection of Safe Shutdown Capability," for Oyster Creek Nuclear Generating station to allow the use of manual actions for demonstrating compliance with Section III.G.2 of Appendix R, which, it asserts were previously approved in Fire Protection SER dated March 24, 1986, and June 25, 1990. In accordance with the scope of work described in Task 1 of Project J-4242, I have reviewed the technical merit of the request submitted by the licensee.

As described in the enclosure, based on the results of that review, I recommend that the requested exemption be granted. It should be noted, however, that confirmation of staff approval of operator manual actions (OMAs) described in the March 3, 2009 request, was beyond the scope of work performed by Brookhaven National Laboratory (BNL). This review assumed that all OMAs identified by the licensee (Exelon) as being previously approved in a Safety Evaluation Report (SER) were, in fact, accepted by the staff.

Per your request, the format and level of detail of this Technical Evaluation Report (TER) is similar to that used by the staff in its evaluation of Exelon Generating Company's exemption request to allow the use of operator manual actions (OMAs) at Peach Bottom Atomic Power Station Units 2 and 3 (TAC Nos. MD7029 AND MD7030).

If you have any questions, please contact me at the phone number or e-mail address indicated above.

Sincerely,

Kenneth Sullivan,
Systems Engineering and Safety Analysis Group

cc: B. Grenier, NRC
D. Diamond
J. Higgins
Project File J4242A, Task 1

ENCLOSURE

EXELON GENERATION COMPANY, LLC,

OYSTER CREEK NUCLEAR GENERATING STATION

DOCKET NO. 50-2 19

EXEMPTION

1.0 BACKGROUND

The Exelon Generation Company, LLC (Exelon, the licensee, in addition to PSEG Nuclear, LLC) is the holder of Facility Operating License Nos. DPR-16 which authorizes the operation of the Oyster Creek Nuclear Generating Station () CNGS). The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC, the Commission) now or hereafter in effect.

The facility consists of a is a single unit Mark 1, General Electric (GE) 2, boiling water reactor (BWR) located in Ocean County, New Jersey.

2.0 REQUEST/ACTION

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.48, requires that nuclear power plants that were licensed before January 1, 1979, satisfy the requirements of 10 CFR Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," Section III.G, "Fire protection of safe shutdown capability." OCNGS was licensed to operate prior to January 1, 1979. As such, the licensee's Fire Protection Program (FPP) must provide the established level of protection as intended by 10 CFR Part 50, Appendix R and Section III.G.

By letter dated, March 3, 2009, "Request for Exemption from 10 CFR 50, Appendix R, Section III.G, "Fire Protection of Safe Shutdown Capability (Phase 1)" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML090630132), Exelon requested an exemption for the Oyster Creek Nuclear Generating Station (OCNGS) to allow the use of operator manual actions (OMA) in lieu of meeting the requirements of Section III.G.2 of Appendix R to 10CFR50.

As described in Regulatory Issue Summary 2006-10, "Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions," for plants licensed before January 1, 1979, an approved exemption is required for all operator manual actions (OMAs) used to achieve compliance with 10 CFR Part 50, Appendix R Section III.G.2, even those that were accepted in a previously-issued NRC Safety Evaluation Report (SER). Accordingly, the licensee is requesting that the NRC approve an exemption request to allow the use of manual actions for demonstrating compliance with Section III.G.2 of Appendix R, which, it asserts were previously approved in Fire Protection SER dated March 24, 1986, and June 25, 1990. These specific manual actions are addressed by Attachment 2 of the licensee's March 3, 2009, request (i.e., Phase 1).

In response to the staff's request for additional information, the licensee provided supplemental information dated April 2, 2010. In response to RAI-01.2, Exelon states that it has re-evaluated its exemption request, and, based on the results of this review, has withdrawn the following fire areas/zones from the request: RB-FZ-1F2, RB-FZ-1F4, RB-FZ-1H, TB-FA-3B, OB-FZ-10B, TB-FZ-11A, TB-FZ-11G, AB-FA-13, DG-FA-15, NR-FA-20, OG-FA-21, OR-FA-19. As a result, the scope of the licensee's Phase 1 exemption request is limited to a total of 13 specific OMAs that may result from fire in the following 22 fire areas/ zones: CW-FA-14, OB-FA-9, OB-FZ-6A , OB-FZ-6B, OB-FZ-8A, OB-FZ-8B, OB-FZ-8C, OB-FZ-10A, RB-FZ-1D, RB-FZ-1E, RB-FZ-1F3, RB-FZ-1F5, RB-FZ-1G, TB-FA-3A, TB-FA-26, TB-FZ-11B, TB-FZ-11C, TB-FZ-11D, TB-FZ-11E, TB-FZ-11F, TB-FZ-11H, and YARD. The 22 fire areas / zones and the thirteen specific OMAs to be performed in the event of fire in each area are described below in Table 1.

In summary, by letter dated March 3, 2009, and a supplemental letter dated April 2, 2010, responding to the NRC staff's request for additional information, Exelon submitted a request for exemption from 10 CFR Part 50, Appendix R, Section III.G, "Fire Protection of Safe Shutdown Capability," to permit the use of a total of 13 operator manual actions (OMA) in the event of fire in 21 separate fire areas / zones of the OCNGS.

3.0 DISCUSSION

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when: (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) one of the special circumstances provided in sub-paragraphs (i) through (vi) of 10 CFR 50.12(a) (2) is present.

Exelon states that it had originally intended to address the special circumstances provided in both 10 CFR 50.12(a) (2) (ii) [underlying purpose of the rule] and 10 CFR 50.12(a) (2) (iii) [undue hardship]. However, in its April 2, 2010 response to RAI-01.2, Exelon states that it no longer cites 10 CFR 50.12(a)(2)(iii) [undue hardship] as a special circumstance under 10 CFR 50.12(a)(2). In its response, Exelon states that the combination of defense-in-depth and the feasibility of the OMAs, demonstrates that the underlying purpose of the rule is met. Consistent with the language included in 10 CFR 50.12(a) (2) (ii).

In accordance with 10 CFR 50.48(b), nuclear power plants licensed before January 1, 1979, are required to meet Section III.G, of 10 CFR Part 50, Appendix R. The underlying purpose of 10 CFR Part 50, Appendix R, and Section III.G is to ensure that the ability to achieve and maintain safe shutdown is preserved following a fire event. The regulation intends for licensees to accomplish this by extending the concept of defense-in-depth to:

1) prevent fires from starting

2) rapidly detect, control, and extinguish promptly those fires that do occur

3) Provide protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant.

The stated purpose of 10 CFR Part 50, Appendix R, Section III.G.2 (III.G.2) is to ensure that one of the redundant trains necessary to achieve and maintain hot shutdown conditions remains free of fire damage in the event of a fire. III.G.2 requires one of the following means to ensure that a redundant train of safe shutdown cables and equipment is free of fire damage, where redundant trains are located in the same fire area outside of primary containment:

a. Separation of cables and equipment by a fire barrier having a 3-hour rating;

b. Separation of cables and equipment by a horizontal distance of more that 20 feet with no intervening combustibles or fire hazards and with fire detectors and an automatic fire suppression system installed in the fire area; or

c. Enclosure of cables and equipment of one redundant train in a fire barrier having a 1-hour rating and with fire detectors and an automatic fire suppression system installed in the fire area.

In its March 3, 2009 and April 4, 2010 submittals, Exelon has requested an exemption from the requirements of III.G.2 for OCNGS to the extent that one of the redundant trains of systems necessary to achieve and maintain hot shutdown is not maintained free of fire damage in accordance with one of the required means specified above for a fire occurring in the following 21 Fire Areas or Zones:

1.	CW-FA-14	Circulatory Water Intake
2.	OB-FA-9	Office Building
3.	OB-FZ-6A	'A' 480V SWGR Rm.
4.	OB-FZ-6B	'B' 480V SWGR Rm.
5.	OB-FZ-8A	Reactor Recirculation MG Set Room
6.	OB-FZ-8B	Mechanical Equipment Room (35' elevation)
7.	OB-FZ-8C	A/B Battery Room, Tunnel and Electrical Tray Room
8.	OB-FZ-10A	Monitor and Change Room Area and Operations Support Area
9.	RB-FZ-1D	Reactor Building elevation 51'-3".
10.	RB-FZ-1E	Reactor Building elevation 23'-6"
11.	RB-FZ-1F3	Reactor Building basement –19'-6" elevation (Northwest corner)
12.	RB-FZ-1F5	Reactor Building basement –19'-6" elevation (Torus room - remaining area of Reactor
13.	RB-FZ-1G	Shutdown Cooling Room - north side of the Reactor Building (elevations 38' and 51'-3")
14.	TB-FA-3A	4160V Emergency Switchgear 1C Vault - Turbine Building Mezzanine 23'-6" elevation - south side
15.	TB-FA-26	125 VDC Battery Room 'C' - Turbine Building Mezzanine 23'-6"

elevation - south side

16. TB-FZ-11B Turbine Lube Oil Storage, Pumping & Purification Area - Turbine Building, elevations 0'-0", 27'-0, 36'-0, and 46'-6"- north side

17. TB-FZ-11C 4160V Switchgear Room 1A and 1B -Turbine Building Mezzanine 23'-6" elevation - west side

18. TB-FZ-11D Turbine Building Basement Floor - elevation 3'-6" - south side

19. TB-FZ-11E Condenser Bay - Turbine Building elevation 0'-0"

20. TB-FZ-11F Feedwater Pump Room - Turbine Building Basement elevation 3'6" - east side

21. TB-FZ-11H Demineralizer Tank and Steam Jet Air Ejector Area, Turbine Building 3'-6" and 23'-6" elevations - southeast side

Exelon states that the OMAs identified in its Phase 1 request were previously found acceptable in fire protection safety evaluation reports dated March 24, 1986 and June 25, 1990, and, therefore, do not need to meet the reliability criteria specified in NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," dated October, 2007.

Each OMA included in this review consists of a sequence of tasks that occur in various fire areas and zones identified above. As discussed below, the OMAs are initiated upon confirmation of a fire in a particular fire area. Listed in the order of the area of fire origin, the OMAs included in this Phase 1 review are as follows:

Area of Fire Origin	Actions
CW-FA-14	Manually open V-9-2099 and V-11-49 and close V-11-63 and V-11-41
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
OB-FA-9	Locally read Condensate Storage Tank level at LI-424-993 due to damage to control circuits.
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
OB-FZ-6A	Locally read CST level at LI-424-993 due to damage to control circuits.
	Use Remote Shutdown Panel to control equipment: RSP, CRD Hydraulic PP NC08B and 480V USS 1B2 Incoming breaker (Operate USS 1B2/CRD Transfer Switch (Partial initiation) to "Alternate" and operate Control Switches for USS-1B2 Main Breaker and B CRD Pump).
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52

Area of Fire Origin	Actions
OB-FZ-6B	Manually open V-9-2099 and V-11-49 and close V-11-63 and V-11-41
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
OB-FZ-8A	Manually open V-9-2099 and V-11-49 and close V-11-63 and V-11-41
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
OB-FZ-8B	Manually open V-9-2099 and V-11-49 and close V-11-63 and V-11-41
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
OB-FZ-8C	Locally read Condensate Storage Tank level at LI-424-993 due to damage to control circuits.
	Manually open V-9-2099 and V-11-49 and close V-11-63 and V-11-41
	Use Local Shutdown Panels to control equipment as follows: LSP-1A2, CRD Hydraulic PP NC08A and 480V USS 1A2 Incoming breaker (Operate transfer switch "Alternate" and operate Control Switch for USS-1A2 Main Breaker 1A2M and A CRD Pump).
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
	Trip all five Reactor Recirculation Pumps (NG01-A, NG01-B, NG01-C, NG01D and NG01E). Also, lockout the 4160V breakers using the 69 Switch
OB-FZ-10A	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
RB-FZ-1D	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
RB-FZ-1E	Read CRD local flow gauge FI-225-998.
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
RB-FZ-1F3	Open Core Spray System II manual valves V-20-1 and V-20-2 and close V-20-4
RB-FZ-1F5	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
RB-FZ-1G	Read CRD local flow gauge FI-225-998.
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
TB-FA-3A	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
	Connect H.P. air cylinder to drain port of accumulator to recharge
TB-FA-26	Manually trip 4160V 1D Breakers and control USS 1B2 and 1B3 480V Breakers locally at LSP-1D
	Manually control 1B3M Breaker from LSP-1B3.
	Manually re-close MCC 1B32 Feeder Breaker at USS 1B3
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52

Area of Fire Origin	Actions
TB-FZ-11B	Manually trip 4160V 1D Breakers and control USS 1B2 and 1B3 480V Breakers locally at LSP-1D
	Locally read Condensate Storage Tank level at LI-424-993
	Manually control 1B3M Breaker from LSP-1B3.
	Local Shutdown Panels used to control equipment as follows: LSP-1B32 Condensate Transfer Pump 1-2 (Operate transfer switch to "Alternate" and operate Control Switch for Condensate Transfer Pump 1-2)
	Manually re-close MCC 1B32 Feeder Breaker at USS 1B3
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
	Trip all five Reactor Recirculation Pumps (NG01-A, NG01-B, NG01-C, NG01D and NG01E) . Also, lockout the 4160V breakers using the 69 Switch
TB-FZ-11C	Manually trip 4160V 1D Breakers and control USS 1B2 and 1B3 480V Breakers locally at LSP-1D
	Manually control 1B3M Breaker from LSP-1B3.
	Manually re-close MCC 1B32 Feeder Breaker at USS 1B3
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
TB-FZ-11D	Manually trip 4160V 1D Breakers and control USS 1B2 and 1B3 480VBreakers locally at LSP-1D
	Manually control 1B3M Breaker from LSP-1B3.
	Local Shutdown Panels are used to control equipment as follows: LSP-DG2, EDG2 and its Switchgear (Operate transfer Switches (3 total) to "Alternate" and operate Control Switch on Diesel Panel to start diesel)
	Manually re-close MCC 1B32 Feeder Breaker at USS 1B3
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
TB-FZ-11E	Manually trip 4160V 1D Breakers and control USS 1B2 and 1B3 480V Breakers locally at LSP-1D
	Locally read Condensate Storage Tank level at LI-424-993
	Manually control 1B3M Breaker from LSP-1B3.
	Local Shutdown Panels used to control equipment as follows: LSP-1B32 Condensate Transfer Pump 1-2 (Operate transfer switch to "Alternate" and operate Control Switch for Condensate Transfer Pump 1-2)
	Local Shutdown Panels are used to control equipment as follows: LSP-DG2, EDG2 and its Switchgear (Operate transfer Switches (3 total) to "Alternate" and operate Control Switch on Diesel Panel to start diesel)
	Manually re-close MCC 1B32 Feeder Breaker at USS 1B3
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
	Trip all five Reactor Recirculation Pumps (NG01-A, NG01-B, NG01-C, NG01D and NG01E) Also, lockout the 4160V breakers using the 69 Switch.
TB-FZ-11F	Manually open V-9-2099 and V-11-49 and close V-11-63 and V-11-41
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52
TB-FZ-11H	Manually open V-9-2099 and V-11-49 and close V-11-63 and V-11-41

Area of Fire Origin	Actions
	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52

Exelon states that the exemptions are being requested from the requirements of Section III.G.2 and are not part of a methodology to shutdown the plant from outside the control room. The areas identified in the exemption requests have been considered III.G.2 since the initial Appendix R submittal. Each of the OMAs is taken to permit shutdown of the plant from the control room. The specific requirements of III.G.2 that are not met are identified for each of the requested exemptions in Attachment 1 of the licensee's April 2, 2010 response.

In response to RAI-01.1 Exelon states that its proposed methodology achieves the underlying purpose of the rule by accomplishing the following:

1) OMAs required for achieving and maintaining hot shutdown conditions are feasible, and not impacted by environmental conditions associated with fires in Appendix R, Section III.G.2 areas.
2) the equipment needed to implement OMAs remains available and the fire areas remain accessible during or following the event.
3) the OMAs are directed by plant procedures and the operators are trained in the use of the procedures.
4) staffing is adequate to perform the OMAs.
5) walkdowns and demonstrations have shown that adequate time is available to perform the OMAs, and
6) time margin is available to account for uncertainties that may arise during a fire event.
7) the requested OMAs are similar to activities performed by plant operators as part of their normal work assignments
8) adherence to the principles of fire protection defense-in-depth.
9)

To address staff concerns regarding the adequacy of defense-in-depth provided for each of the fire areas / zones included in its requests, Exelon developed a Fire Hazards Analysis (FHA) which was included as Attachment 2 of its April 2, 2010 response. For each of the areas / zones included in the request, Exelon states that the fire protection configuration provided achieves a level of protection commensurate with that intended by Appendix R, Section III.G.2. For each fire area / zone, the FHA describes the physical location and arrangement of equipment, combustible loading, ignition sources, fire protection features, and proximity of redundant safe shutdown equipment to in situ hazards and identifies deviations from fire protection codes and previously approved exemptions.

In the March 3, 2009 request, the licensee outlined the approach that was taken to evaluate and assess the effectiveness of the operator manual actions included in the request and explains where each operator manual action is located and the role of the actions in achieving safe shutdown. In its April 2, 2010 response to a Request for Additional Information the licensee provides a discussion and justification for why the operator manual actions are appropriate for maintaining consistency with the intent of Section III.G.2 of Appendix R. The NRC staff reviewed the licensee's evaluation in support of the subject exemption request for the use of operator manual actions in lieu of the requirements specified in Section III.G.2 of Appendix R, and concluded that given the existing fire protection features in the affected fire zones, Exelon continues to meet the underlying purpose of 10 CFR Part 50, Appendix R, Section III.G.2 for the OCNGS fire areas described in Attachment 1 The following technical evaluation provides the basis for this conclusion.

3.1 Fire Prevention

In response to staff requests for additional information Exelon developed a Fire Hazards Analysis (FHA) for each fire area / zone identified in its exemption request. For each fire area / zone, the FHA describes the physical location and arrangement of equipment, combustible loading, ignition sources, fire protection features, and proximity of redundant safe shutdown equipment to in situ hazards and identifies deviations from fire protection codes and previously approved exemptions. In addition, for each fire area/zone the licensee's response includes a tabulation of potential ignition sources as well as the equipment that may exhibit high energy arcing faults. For each fire area / zone, the FHA states that the fire protection configuration achieves a level of protection commensurate with that intended by Appendix R, Section III.G.2

All 21 areas / zones identified in the request have limited or low combustible fuel loading (equivalent fire severity of less than 45 minutes) except areas OB-FZ-6A, OB-FZ-6B, and TB-FZ-11B. Fire areas OB-FZ-6A and OB-FZ-6B, have low to moderate combustible fuel loading (equivalent fire severity of less than 105 minutes) and TB-FZ-11B has a high combustible fuel loading (equivalent fire severity of greater than 105 minutes). Areas with moderate or greater fuel loading have adequate detection and suppression systems appropriate for the hazard.

The fire areas included in the exemption are not shop areas so hot work activities are infrequent with administrative controls (e.g., hot work permits, fire watch, and supervisory controls) programs in place if hot work activities do occur. The administrative controls are described in the OCNGS Fire Protection Program (FPP), which is incorporated into the Updated Final Safety Analysis Report.

Unless noted otherwise below, all of the fire areas included in this exemption have a combustible fuel load that is considered to be low with fuel sources consisting primarily of fire retardant cable insulation and limited floor based combustibles. Unless noted otherwise, there are no high energy ignition sources located in the areas and the areas.

Fire Area	Combustible Loading
CW-FA-14	Fire Area CW-FA-14 is an outdoor structure with no walls or ceiling. This fire area consists of a structure that is remote from the power block and other outdoor equipment (e.g., main transformers, etc.) that is open to the environment. Combustible loading consists of transformer liquid and electrical motors although it is not quantified because there is nothing to contain the heat release in the event of a fire.. The main combustible in this area that could result in the need for the OMAs is Dow Corning 561 Silicon transformer liquid. The licensee states that the transformer liquid has characteristics that minimize the likelihood of a fire involving the insulating liquid itself
OB-FA-9	This area has an administrative fire loading limit of less than 1.5 hours as determined by the ASTM E119 time-temperature curve. The major combustibles in the MUX Corridor are cable insulation and a wood ceiling on top of the MUX enclosure.
OB-FZ-6A	Fire loading in this fire zone is moderate. This area has an administrative fire loading limit of less than three hours as determined by the ASTM E119 time-temperature curve. The main combustibles in this area are cable insulation (approximately 81% of loading) and Dow Corning 561 Silicon transformer liquid (approximately 15% of loading). The transformer liquid has characteristics that minimize the likelihood of a fire involving the insulating liquid itself.
OB-FZ-6B	Fire loading in this fire zone is moderate. Fire Zone OB-FZ-6B floor area is approximately 679 sq. ft. This area has an administrative fire loading limit of less than two hours as determined by the ASTM E119 time-temperature curve. The main combustibles in this area are cable insulation (approximately 28% of loading), Thermo-Lag (approximately 29% of loading) and Dow Corning 561 Silicon transformer liquid (approximately 31% of loading). The transformer liquid has characteristics that minimize the likelihood of a fire involving the insulating liquid itself
OB-FZ-8A OB-FZ-8B	Fire Zones OB-FZ-8A and 8B are evaluated together for the combustible loading and FSSD analysis. These fire zones have an administrative fire loading limit of less than 45 minutes as determined by the ASTM E119 time-temperature curve. There are very minimal combustibles in Fire Zone OB-FZ-8B. The major combustibles in Fire Zone OB-FZ-8A are lubricating oil (approximately 83% of loading) and cable insulation (approximately 13% of loading).
OB-FZ-8C	This area has an administrative fire loading limit of less than 1.5 hours as determined by the ASTM E119 time-temperature curve. The main combustibles in this area are the plastic battery cases and racks (approximately 56% of loading) and cable insulation (approximately 39% of loading).
OB-FZ-10A	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. This limit is tied to an NRC-accepted approach for dealing with fire zone boundaries (refer to the response to RAI-04.3 in Attachment 1 for more details). The major combustibles in this area are cable insulation (approximate 27% of loading), rubber flooring (approximately 31% of loading), miscellaneous plastics (approximately 17% of loading) and Protective

Fire Area	Combustible Loading
	Clothing (PC) supplies (approximately 20% of loading). However, since the PCs have been placed in metal cans with self-closing lids they are no longer considered a contribution to the combustibles in this area.
RB-FZ-1D	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The main combustible in this area is attributed to cable insulation (approximately 84% of loading).
RB-FZ-1E	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The main combustible in this area is attributed to cable insulation (approximately 84% of loading).
RB-FZ-1F3	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The major combustibles in this area are cable insulation (approximately 58% of loading), ladders (approximately 16% of loading) and lubricating oil in pumps (approximately 16% of loading).
RB-FZ-1F5	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The major combustibles in this area are cable insulation (approximately 19% of loading) and gratings (approximately 76% of loading). The grating, which is the largest plastic material in this area, has a flame spread of less than 25.
RB-FZ-1G	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The main combustibles in this area are cable insulation (approximately 12% of loading), plastic (approximately 57% of loading) and Class A combustibles (approximately 14% of loading). The grating, which is the majority of the plastic material in this area, has a flame spread of less than 25.
TB-FA-3A	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. There are minimal amounts of cable insulation (approximately 5% of loading) miscellaneous plastic (approximately 73% of loading) and class A combustibles such as paper for procedures (approximately 20% of loading) in this area.
TB-FA-26	This area requires an administrative fire loading limit of less than 90 minutes as determined by the ASTM E119 time-temperature curve. The major combustibles in this area are plastic, which is contributed by the battery cases (approximately 92% of loading) and cable insulation (approximately 6% of loading).
TB-FZ-11B	This fire zone has administrative controls such that additional combustible materials are not introduced into this zone and defense-in-depth features to control a potential oil fire in this zone The major combustibles in this area are lubricating oil (approximately 99% of loading) and cable insulation (approximately 0.3% of loading). The amount of oil contained in the lube oil storage tanks in this fire zone drives the combustible loading in this fire zone to approximately 14 hours.

Fire Area	Combustible Loading
TB-FZ-11C	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The main combustible loading is attributed to cable insulation (approximately 73% of loading) and plastic (approximately 17% of loading).
TB-FZ-11D	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The major combustibles in this area are cable insulation (approximately 29% of loading), Dow Corning 561 Silicon transformer liquid (approximately 15% of loading) and lubricating oil (approximately 40% of loading).
TB-FZ-11E	This Fire Zone (Condenser Bay) is procedurally controlled as a transient combustible free area in procedure OP-AA-201-009 while the plant is operating. This area is a high radiation area during plant operation and is not normally accessed. The area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The major combustibles in this area are cable insulation (approximately 40% of loading) and plastic (approximately 59% of loading). The grating, which is the largest plastic material in this area, is dispersed throughout this fire zone (not concentrated) and has a flame spread of less than 25.
TB-FZ-11F	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The major combustible load consists of cable insulation (approximately 15% of loading), lubricating oil (approximately 39% of loading), rubber (approximately 21% of loading) and plastics (approximately 17% of loading). The licensee states that the majority of the combustible loading attributed to rubber and plastic was due to the storage of hoses which are now no longer in the area.
TB-FZ-11H	This area has an administrative fire loading limit of less than 30 minutes as determined by the ASTM E119 time-temperature curve. The major combustibles are cable insulation (approximately 23% of loading), ladders and other miscellaneous plastics (approximately 55% of loading) and miscellaneous ordinary combustibles.

The NRC staff finds that for all of the areas related to this exemption, the level of fire protection combined with the limited fuel load and minimal ignition sources in the fire areas associated with this exemption results in a low likelihood of a fire occurring and spreading to adjacent fire areas or equipment.

3.2 Detection, Control and Extinguishment

OCNGS has been divided into fire areas and subdivided into fire zones, as described in the OCNGS FPP. Three-hour fire barriers are normally used to provide fire resistive separation between adjacent fire areas. Subdivision of fire areas into fire zones utilizes non fire rated boundaries. In general, fire rated assemblies consist of reinforced concrete or concrete block walls which have commonly accepted fire endurance ratings based upon thickness. For the purposes of analysis, subdivision of fire areas into fire zones takes into consideration the physical boundaries which exist between one fire zone and another within the same fire area.

The NRC staff evaluated the fire detection, control and suppression systems associated with the areas related to this exemption. Unless noted otherwise below, fire areas are provided with ionization smoke detectors in various locations within a particular fire area.

Fire Area	Detection, Control and Extinguishment Capability
CW-FA-14	This fire area consists of a structure that is remote from the power block and other outdoor equipment (e.g., main transformers, etc.) that is open to the environment. There is no fire detection or fixed fire suppression systems in this fire area. However, a security tower monitors this area continuously; therefore, any fire of significance would be detected and responded to appropriately by the station fire brigade.Manual suppression is provided by a fire hydrant and fire hose house located approximately 75 feet from the principal fire hazards, USS 1B3 and associated transformer..
OB-FA-9	Detection of a fire in the MUX corridor above the MUX enclosure would be by the installed suppression system in that area; detection in the remaining portion of the area would be by the installed detection in the main hallways and inside of the MUX room enclosure or by personnel since this is a high traffic area. Extinguishment of a fire in the majority of this area will be accomplished by the plant fire brigade.
OB-FZ-6A	This area is protected by automatic detection, a total flooding Halon 1301 System, and manual fire fighting capabilities (portable extinguishers and hose stations)
OB-FZ-6B	This area is protected by automatic detection, a total flooding Halon 1301 System, and manual fire fighting capabilities (portable extinguishers and hose stations)
OB-FZ-8A OB-FZ-8B	OB-FZ-8A is provided with a partial area coverage closed head automatic sprinkler system installed throughout the majority of this fire zone (over MG Sets). An alarm is provided to the Control Room when water flows from a single sprinkler head. A smoke detector is provided in the exhaust duct of the ventilation system. SER dated June 25, 1990 provided an exemption for not having automatic fire detection. A new fire detection system has been installed in the Mechanical Equipment Room (Fire Zone OB-FZ-8B-35' elevation) and the adjacent corridor where the fire alarm panel (LFAP #8) is installed. Local Fire Alarm Panel (LFAP) #8 was expanded to provide smoke detection capability for these two rooms. Fire extinguishers are provided for manual fire fighting backup. Hose lines are available from outside hydrants and hose houses.
OB-FZ-8C	A fixed, total flooding, Halon 1301 extinguishing system will discharge throughout the area. Smoke detectors are installed at the ceiling level and cross-zoned to sound a local alarm and an alarm in the Control Room upon actuation of one detector. Actuation of a second detector will sound a local alarm, discharge the halon system, trip supply and exhaust fans, and close dampers.
OB-FZ-10A	A closed head automatic sprinkler system is throughout the area. In addition, a hose station located nearby outside the Control Room provides manual suppression capability.
RB-FZ-1D	Area-wide smoke detection system and automatic a fixed deluge water spray system installed over cable trays and open hatches The deluge suppression system protecting safety related cable trays is automatically activated by a cross-zoned detection system consisting of linear heat detection wire located on top of the cables

Fire Area	Detection, Control and Extinguishment Capability
	in each original safety related cable tray as was committed to in the comparison to BTP 9.5-1, Appendix A, and intelligent smoke detectors are located in each beam pocket at the ceiling.
RB-FZ-1E	Area-wide smoke detection system and automatic a fixed deluge water spray system installed over cable trays and open hatches The deluge suppression system protecting safety related cable trays is automatically activated by a cross-zoned detection system consisting of linear heat detection wire located on top of the cables in each original safety related cable tray as was committed to in the comparison to BTP 9.5-1, Appendix A, and intelligent smoke detectors are located in each beam pocket at the ceiling.
RB-FZ-1F3	Smoke detectors which alarm locally and in the control room are installed over hazards (located in the vicinity of the hazards and are not located at the ceiling). Fire extinguishers are provided for manual fire fighting backup. Hose lines are available from outside hydrants and hose houses.
RB-FZ-1F5	Due to the negligible combustible loading and the nature of the combustibles A fire in this zone is not expected to be of significant size or duration. Extinguishment will be accomplished by the plant fire brigade.
RB-FZ-1G	Due to the negligible combustible loading and the nature of the combustibles A fire in this zone is not expected to be of significant size or duration. Extinguishment will be accomplished by the plant fire brigade.
TB-FA-3A	A manually actuated CO_2 system designed to achieve a 50% concentration which is maintained for a minimum of seven minutes was approved in SER dated March 3, 1978.
TB-FA-26	Area-wide automatic preaction sprinkler protection Area-wide smoke detection.
TB-FZ-11B	Detection and suppression systems are installed to protect against the lube oil hazard in the area. Automatic suppression over principal combustibles A Closed head automatic sprinkler system protects cable trays and open head water spray deluge system protects oil handling equipment and the oil storage tank. Thermal detectors are located in close proximity to the lube oil tank so that a lube oil fire would be quickly detected, which in turn would activate the deluge system for extinguishment.
TB-FZ-11C	Area-wide automatic fixed preaction sprinkler system (except for the small caged area located to the east of Fire Area TB-FA-3A)
TB-FZ-11D	Closed head automatic sprinkler and spray systems protect the south end basement area and the hydrogen seal oil unit. An exemption was granted from the requirements of Appendix R Section III.G.2 in SERs dated March 24, 1986 and June 25,1990 for not having area-wide automatic fire detection and suppression system in Fire Zone TB-FZ-11D. The primary basis for this exemption is the presence of the automatic wet pipe sprinkler system, low fire loading and the one-hour barrier protection for safe shutdown circuits. Also, the flow alarm will notify the control room of any sprinkler system activation. Since
TB-FZ-11E	The Condenser Bay is procedurally controlled as a transient combustible free area in procedure OP-AA-201-009 while the plant is operating. Extinguishment of the will be accomplished by automatic fixed suppression system and the plant fire brigade. A closed head automatic sprinkler system was recently expanded to provide fire suppression over the cables in cable trays in the northeast side of the condenser bay An exemption was granted from the requirements of Appendix R, Section III.G.2 in SERs dated March 24, 1986 and June 25, 1990 for not having a fixed fire

Fire Area	Detection, Control and Extinguishment Capability
	detection system in this area. The primary basis for this exemption is the presence of the automatic wet pipe sprinkler system and low fire loading.
TB-FZ-11F	A new area-wide fire detection system (thermal detection) has recently been installed. Extinguishment of the will be accomplished by the plant fire brigade
TB-FZ-11H	A new fire detector (thermal detection) has recently been installed in the stairwell area. The system alarms locally and in the control room. Manual extinguishment of fire will be accomplished by the plant fire brigade

All fire areas included in this exemption have automatic detection systems installed except Fire Zones TB-FZ-11D, TB-FZ-11E, CW-FA-14, and the Yard Area.

For Fire Zone TB-FZ-11D, an exemption was granted from the requirements of Appendix R Section III.G.2 in SERs dated March 24, 1986 and June 25, 1990 for not having area-wide automatic fire detection and suppression system. The primary basis for this exemption is the presence of the automatic wet pipe sprinkler system, low fire loading and the one-hour barrier protection for safe shutdown circuits. Also, the flow alarm will notify the control room of any sprinkler system activation. Since a fire in this area would not impede the plant's capability for safe shutdown, this exemption does not impact the basis for the manual exemption request.

The lack of a fixed fire detection capability in Fire Zone TB-FZ-11E was addressed by the staff in an exemption granted by the staff in SERs dated March 24, 1986 and June 25, 1990. The primary basis for this exemption is the presence of the automatic wet pipe sprinkler system and low fire loading. Since a fire in this area would not impede the plant's capability for safe shutdown, this exemption does not impact the basis for the manual exemption request.

Fire Area CW-FA-14, Circulatory Water Intake, is an outside area greater than 100 feet from any building except for the fish sample pool enclosure which is constructed of non-combustible material. The lack of automatic detection is compensated for by continuous monitoring of the area by security personnel located in a nearby tower. The licensee further states that numerous indications and symptoms would remain available in the Control Room to ensure that the need to perform the requested OMAs would be readily diagnosed.

Automatic fire detection systems are also not installed in outside locations classified as the Yard Area. However, since the area is under constant observation both by humans and electronic devices (cameras), a fire would be detected and appropriate actions taken without significant delay.

Fire areas OB-FA-9, OB-FZ-8A, RB-FZ-1F3, TB-FZ-11B, and TB-FZ-11H have partial area detection systems installed to address specific fire hazards. Fire Area OB-FA-9 consists of three floors of the Office Building. Detection which alarms locally and in the control room is provided in the main hallways and inside of a small area known as the MUX room enclosure. The licensee states that the majority of this fire area is normally traveled since it is the main path to the control room. However, the MUX corridor, which is adjacent to the south wall of the control room, is not a normally traveled area. Detection of a fire in the MUX corridor would be by the installed suppression system.

In Fire Area TB-FZ-11B, detection and suppression systems are installed to protect against the lube oil hazard in the area. Automatic detection is provided by a rate of rise/fixed temperature fire detection system at the lube oil tank. Locating the detectors in close proximity to tank provides for prompt detection of an oil fire, which in turn activates a deluge suppression system for extinguishment.

There is no area-wide detection system provided for Fire Zone OB-FZ-8A. Detection within OB-FZ-8A consists of a duct smoke detector located in the exhaust duct of fan EF-1-20. An exemption was granted from the requirements of Appendix R, Section III.G.2, for not providing area detection in this area. This exemption was approved in the NRC SER dated June 25, 1990 based on the fact that any fire which might occur in Fire Zone OB-FZ-8A will be relatively small and will be controlled by the automatic sprinkler system. Since operation of the sprinkler system will alarm in the control room, prompt notification of and response by, the fire brigade for any required manual fire fighting activities is expected. In addition, OB-FZ-8A is analyzed together with OB-FZ-8B for combustible loading and safe shutdown purposes and area-wide detection is provided in Fire Zone OB-FZ-8B which alarms locally and in the control room.

The detection capability provided for RB-FZ-1F3 consists of smoke detectors which alarm locally and in the control room, that are located in close proximity to the hazard (i.e., over pumps and cable tray. Since they are not mounted at the ceiling this is a deviation from NFPA 72E, 1974 Edition. The licensee states that an evaluation of this deviation has determined that positioning the detectors closer to the hazard improves the detectors' responsiveness to the major hazards in the area.

Fire Zone TB-FZ-11H also lacks area-wide detection coverage. For a fire in this fire zone the licensee states that the "A" train of power is credited and available since they are located outside of this fire zone. However, there are two "B" Train 125 VDC control power cables associated with the non-protected train routed in conduits which traverse through the stairway area of this zone at approximately elevation 10'. An OMA for utilizing fire water would be required if these conduits are affected by fire. In addition to installing a new fire detector in the stairwell area near these conduits the licensee states that no ignition sources are located in the portion of the Zone where the conduits are routed.

Fire areas OB-FZ-6A, OB-FZ-8C, OB-FZ-10A, TB-FA-3A, TB-FA-26, TB-FZ-11B TB-FZ-11C, TB-FZ-11D and TB-FZ-11E have area wide fire suppression systems installed to mitigate the specific fire hazards located in the area. Fire Areas OB-FZ-6A, the B Train Switchgear Portion of OB-FZ-6B and OB-FZ-8C are provided with total flooding Automatic Halon 1301 Systems. TB-FA-3A is provided with a manually actuated, total flooding, CO_2 system. OB-FZ-10A, TB-FA-26, TB-FZ-11B, TB-FZ-11C TB-FZ-11D and TB-FZ-11E have automatic sprinklers.

Fire Areas OB-FA-9, OB-FZ-8A, RB-FZ-1D, RB-FZ-1E have partial coverage suppression to suppress fires that may occur due to the specific hazard. Fire Area OB-FA-9 has closed head sprinkler systems that provide coverage of the MUX room corridor over the MUX enclosure and the MUX Enclosure. In addition, fire extinguishers and hose stations are provided for manual fire fighting. Fire Area OB-FZ-8A has partial automatic wet pipe sprinklers. An alarm will sound in the control room when the automatic fire suppression system operates. Fire loading in this fire zone is low, consisting primarily of lubricating oil and cable insulation. Safety related cable trays in Fire Zones RB-FZ-1D and RB-FZ-1E are protected by automatic fixed deluge water spray systems which are automatically activated by cross-zoned detection systems.

Fire Areas CW-FA-14, OB-FZ-8B, RB-FZ-1F3, RB-FZ-1F5, RB-FZ-1G, TB-FZ-11H and the Yard are protected by manual fire fighting capabilities.

Fire Area CW-FA-14 is an outdoor structure that is remote from the power block and other outdoor equipment (e.g., main transformers, etc.). Since the area is continuously monitored by security personnel located in a nearby tower, prompt notification of the station fire brigade is assured.

Fire Zone OB-FZ-8B has a small floor area (approximately 479 sq. ft) and the combustibles located in this Zone are very minimal. The major combustibles in Fire Zone OB-FZ-8A are lubricating oil (approximately 83% of loading) and cable insulation (approximately 13% of loading). There are no components or cables that will cause the loss of the "B" Train of Power in Fire Zone OB-FZ-8B. This area is accessed only through a single locked door with a vital access door lock so access into the room is restricted. There are no credible ignition sources in this room that would impact the credited cables located in conduit in the room below. Manual fire suppression consists of portable fire extinguishers with hose stations for backup.

Fire Zone RB-FZ-1F3 floor area is also small (approximately 560 sq. ft.). The major combustibles in this area are cable insulation (approximately 58% of loading), ladders (approximately 16% of loading) and lubricating oil in pumps (approximately 16% of loading). The fire loading in Fire Zones RB-FZ-1F3 and RB-FZ-1F5 is defined as "low" in the FHAR. Fixed combustibles are limited to molded fiberglass reinforced polyester grating and minor amounts of lube oil in the various pumps. Manual fire suppression consists of portable fire extinguishers with hose stations for backup. In a Safety Evaluation dated June 25, 1990 the staff approved an exemption for not having area-wide automatic fire suppression in fire zone RB-FZ-1F based on the low combustible loading and the fact that the fire detection would alert the fire brigade to the onset of a fire in the zone so that prompt manual suppression of any fire could be accomplished.

Fire Zone RB-FZ-1G is approximately 1609 sq. ft. The main combustibles in this area are cable insulation (approximately 12% of loading), plastic grating (approximately 57% of loading) and Class A combustibles (approximately 14% of loading). Manual fire suppression consists of portable fire extinguishers with hose stations for backup.

The major combustibles in TB-FZ-11H are cable insulation (approximately 23% of loading), ladders and other miscellaneous plastics (approximately 55% of loading) and miscellaneous ordinary combustibles. The fire loading is "low" as defined in the FHAR. No fire safe shutdown equipment is located in this area but there are two "B" Train 125 VDC control power cables (non-protected train) that traverse through the stairway area of this zone at approximately elevation 10 ft. Manual fire suppression consists of portable fire extinguishers with hose stations for backup.

The Yard Area is located outside. Combustible loading is spread throughout the yard but is not quantified because there is nothing to contain the heat release in the event of a fire. Significant hazards in this area (e.g., SBO transformer) are protected by a suppression system. In addition, The Yard Area is in constant observation both by humans and electronic devices (cameras), so that if a fire would occur, it would be detected and appropriate actions taken without significant delay. Manual suppression is provided by a hose station from the office building and by fire hydrants located throughout the yard area.

The NRC staff finds that the fire barriers, fire detection, control and suppression systems are adequate to mitigate and contain the fire hazards in the 22 areas identified in the licensee's request.

3.3 Preservation of Safe Shutdown Capability

The NRC staff has evaluated the feasibility review provided by the licensee in the April 2, 2010, Response to Request for Additional Information. The feasibility review documents that procedures are in place, in the form of fire response procedures, to ensure that clear and accessible instructions on how to perform the manual actions are available to the operators. All of the requested OMAs are directed by plant procedures, and the operators are trained in the use of the procedures. Specifically, procedure ABN-29, Plant Fires, is entered whenever a fire or indication of a fire occurs on the main fire alarm panel in the control room or at any local fire alarm panel. In addition to dispatching a radio-equipped operator to the alarming location, ABN-29 also directs that the fire brigade be dispatched whenever a fire suppression system has actuated (sprinkler, deluge, Halon, CO2) or a fire is confirmed. In addition, ABN-29 directs immediate entry into the Fire Support Procedure (FSP) for the affected fire area as soon as the existence of a fire is confirmed. The licensee states that the following indications or symptoms are considered examples of a confirmed fire:

- Fire detection alarm and equipment malfunction indication or alarms within the same area;
- Fire pump start and either sprinkler flow alarm or deluge flow alarm;
- Gaseous suppression system actuation;
- Report from the field of an actual smoke condition or actual fire condition.
- Fire detection alarm with follow up confirmation by field operator.

Entering the FSP means that the operator will review the FSP, identify equipment that could be affected, identify equipment that will be available, monitor plant equipment from the control room and communicate with the fire brigade leader. Based on the symptoms received in the control room and the feedback from the fire brigade leader, the operator will decide using the procedure what mitigating actions are necessary. In the event that a plant shutdown has occurred before the FSP is entered, the operator will still enter the FSP based on the fire and initiate the OMAs as appropriate. OMAs that are considered "prompt" (i.e., those that must be done within 45 minutes or less) are identified in both ABN-29 and in the applicable Fire Support Procedures as an item requiring immediate attention. The operators are trained to perform prompt actions first and prioritize them based upon existing plant conditions. The FSPs are based on the worst-case loss considerations by assuming all fire damage occurs instantaneously and thus all operator manual actions will be required. The use of the Emergency Operating Procedures (EOPs) in conjunction with the applicable FSPs will permit the use of any mitigating system available first, and if a desired system is not available, the FSP provides a contingency action to restore the system or provide another means to perform the function. Operator training, including simulator demonstrations and plant walk downs, has been performed to ensure consistency in operator and team response for each OMA.

Several potential environmental concerns are also evaluated, such as radiation levels, temperature/humidity conditions and the ventilation configuration and fire effects that the operators may encounter during certain emergency scenarios. The licensee's feasibility review concluded that the operator manual actions were feasible because the operators performing the manual actions would not be exposed to adverse or untenable conditions during any particular operator manual action procedure or during the time to perform the procedure. An action is considered feasible if it is shown that it is possible to be performed within the available time (considering relevant uncertainties in estimating the time available). The licensee states that OMAs required for achieving and maintaining hot shutdown conditions are feasible, and not impacted by environmental conditions associated with fires in the fire area identified in the request. Each of the safe shutdown calculations that provide the technical basis for the FSPs contains a timeline for operator actions for the specific fire area. In addition, the equipment needed to implement OMAs remains available and the fire areas remain accessible during or following the event.

An operator may need to re-enter Fire Zone RB-FZ-1E to manually manipulate three 2-inch CRD System valves V-15-237, V-15-30 and V-15-52 that are physically located within four feet of each other within the spray area of the automatic localized fixed water spray deluge system installed in this fire zone. An exemption was granted in SER dated June 25, 1990 for not providing either additional separation from in-situ combustibles or protection for CRD System valve V-15-30. Valves V-15-237, V-15-52 and V-15-30 are physically within four feet of each other; therefore, the technical basis of the exemption is considered to be equally valid for these two additional valves. In addition, the licensee states that the actions can be performed in 15 minutes and there are 204 minutes available between the start of the event and when the actions need to occur to restore CRD flow.

For each of the fire areas included in this exemption, the postulated fire scenarios and pertinent details are summarized in Table 1 below.

The NRC staff reviewed the required operator manual action completion time limits versus the time before the action becomes critical to safely shutting down the unit as presented in the feasibility analyses. In one case the action must be completed within 30 minutes. This action is identified as OMA Phase 1 #16 and requires an operator to manually trip the Reactor Recirculation Pumps "A," "B," "C," "D" and "E" at the 4160V Switchgear 1A and 1B. The action may be required as a result of fire in OB-FZ-8C, TB-FZ-11B, or TB-FZ-11E. The symptom for this action is the inability to trip the Recirculation Pumps from the control room and this is detected using the associated pump breaker indicating lights, alarms and flow indications. The Fire Support Procedures direct the operator to trip the pumps using the pump control switches or the Recirculation Pump Trip circuitry (two trip coils for pumps). If both of these methods fail on one or more pumps, the guidance is given to trip the pumps from the 4160V Switchgear 1A and 1B located outside the control room in Fire AreaTB-FZ-11C. Only one operator would be required and it would take approximately 13 minutes for access to the area and to perform the action of tripping the breakers. Given the low complexity of this action, the! \IRC staff finds that there is a sufficient amount of time available to complete the proposed operator manual actions.

3.4 Evaluation

As stated in 10 CFR Part 50, Appendix R, and Section 1/: The fire protection program shall extend the concept of defense-in-depth to fire protection with the following objectives:

1. To prevent fires from starting,
2. To detect rapidly, control, and extinguish promptly those fires that do occur, and
3. To provide protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not

prevent the safe shutdown of the plant.

The NRC staff has evaluated the elements of defense-in-depth used for fire protection at OCNGS, applicable to the fire zones under review. Based upon consideration of the limited fire ignition sources and fire hazards in the affected areas, and the existing fire protection measures at OCNGS, the NRC staff concludes that objective one of defense-in-depth is adequately met.

Based on the evaluation of fire detection and suppression systems provided in the affected fire zones, the NRC staff determined that any postulated fire is expected to be promptly detected by the fire detection systems in the associated fire areas. The available fire detection and suppression equipment in these fire areas ensure that a postulated fire will not be left unchallenged. In addition, all fire areas are separated from adjacent fire areas by suitable fire-rated barriers to provide a level of compartmentalization between the fire areas and/or buildings. This compartmentalization helps to ensure that fires will not spread to adjacent fire areas and that any fire damage will be limited to the fire area of origin. In addition, when fires are contained in the fire area of origin, the licensee has demonstrated that the manual actions are feasible. Therefore, the NRC staff concludes that objectives 2 and 3 of defense-in-depth are adequately met.

Therefore, the NRC staff concludes that the requested exemption to use operator manual actions in lieu of the requirements of 10 CFR Part 50, Appendix R, Section III.G.2 is consistent with the defense-in-depth methodology necessary at nuclear power plants and will not impact OCNGS post-fire safe-shutdown capability.

3.5 Authorized By Law

This exemption would allow OCNGS the use of operator manual actions in lieu of meeting the requirements specified in 10 CFR Part 50, Appendix R, and Section III.G.2. As stated above, 10 CFR 50.12 allows the NRC to grant exemptions from the requirements of 10 CFR Part 50. The NRC staff has determined that granting of the licensee's proposed exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations because special circumstances exist that warrant the use of the operator manual actions to achieve safe shutdown. Therefore, the exemption is authorized by law.

3.6 No Undue Risk to Public Health and Safety

The underlying purpose of 10 CFR Part 50, Appendix R, Section III.G.2 is to ensure that one of the redundant trains necessary to achieve and maintain hot shutdown conditions remains free of fire damage in the event of a fire. Based on the existing fire barriers, fire detectors, automatic and manual fire suppression equipment, fire protection requirements, and the absence of significant combustible loads and ignition sources in the fire areas associated with this exemption, the NRC staff has concluded that application of 10 CFR Part 50, Appendix R, Section III.G.2 for these fire areas is not necessary to achieve the underlying purpose of this regulation.

The NRC staff has determined that the exemption to allow OCNGS the use of operator manual actions in lieu of the requirements specified in 10 CFR Part 50, Appendix R, and Section III.G.2 does not increase the probability or consequences of previously evaluated accidents. This determination is based on the NRC staff finding that the operator manual actions are not the sole form of protection relied upon due to the other fire protection features in place and the manual actions are considered feasible and provide safe shutdown capability following a fire. The combination of the operator manual actions, in conjunction with all of the measures and systems discussed above, results in an adequate level of protection. No new accident initiators are created by allowing use of operator manual actions in the fire areas identified in the exemption and the probability of postulated accidents is not increased. Similarly, the consequences of postulated accidents are not increased. Therefore, there is no undue risk (since risk is probability multiplied by consequences) to public health and safety.

3.7 Consistent with Common Defense and Security

The proposed exemption would allow OCNGS the use of specific operator manual actions in lieu of meeting the requirements specified in 10 CFR Part 50, Appendix R, and Section III.G.2. This change, to the operation of the plant, has no relation to security issues nor does it diminish the level of safety from what was intended by the requirements contained in Section III.G.2. Therefore, the common defense and security is not impacted by this exemption.

3.8 Special Circumstances

One of the special circumstances described in 10 CFR 50.12(a) (2) (ii) is that the application of the regulation is not necessary to achieve the underlying purpose of the rule. The underlying purpose of 10 CFR Part 50, Appendix R, Section III.G.2 is to ensure that one of the redundant trains necessary to achieve and maintain hot shutdown conditions remains free of fire damage in the event of a fire. For the fire areas specified in Table 1 of this exemption, the NRC staff finds that the operator manual actions are feasible and the existing configuration described herein will ensure that a redundant train necessary to achieve and maintain safe shutdown of the plant will remain free of fire damage in the event of a fire in these fire zones. Since the underlying purpose of 10 CFR Part 50, Appendix R, Section III.G is achieved, the special circumstances required by 10 CFR 50.12(a)(2)(ii) for the granting of an exemption from 10 CFR Part 50, Appendix R, Section III.G.2 exist.

4.0 Conclusion

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Also, special circumstances are present such that application of the regulation in these particular circumstances is not necessary to achieve the underlying purpose of the rule. Therefore, the Commission hereby grants Exelon an exemption from the requirements of Section III.G.2 of Appendix R of 10 CFR Part 50, to OCNGS for the 21 operator manual actions specified in Table 1.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment (74 FR 5191).

TABLE 1

Requested OMAs and Initiating Fire Areas / Zones

TABLE 1

Phase 1 OMAs

OMA Number	Purpose	Fire Affected Component	Initiating Fire Area	Actions	Action Location
1	Manual actions are required to isolate damaged cables and reestablish control locally for the 4160V Switchgear 1D and LSP-1D	Cables associated with 4160V Switchgear 1D and LSP-1D control	TB-FA-26	Trip 4160V breakers and lockout using the 69 Switch for all Feeder Breakers except 1B2P and 1B3P. Local Shutdown Panels used to control equipment as follows: LSP-1D 4160V Switchgear 1D Breakers for USS 1B2 and 1B3 (Operate Transfer Switch to "Alternate" and operate Control Switch for feeder breakers for USS 1B2 and 1B3	TB-FA-3B
2	Condensate Storage Tank (CST) level Ind.	Primary CST level indicator 5F-27	OB-FA-9 OB-FZ-6A OB-FZ-8C	Locally read CST level at LI-424-993	Yard (at CST)
3	Manual actions for Hot Shutdown are required to isolate damaged cables and reestablish control locally for 480V USS 1B3 electrical power breakers.	Cables associated with 480V USS 1B3	TB-FA-26 TB-FZ-11B TB-FZ-11C TB-FZ-11D TB-FZ-11E	Local Shutdown Panels used to control equipment as follows: LSP-1B3 480V USS 1B3 incoming breaker. (Operate transfer Switch to "Alternate" and then operate Control Switch for USS 1B3 Breaker 1B3M)	CW-FA-14

OMA Number	Purpose	Fire Affected Component	Initiating Fire Area	Actions	Action Location
4	Manual actions for Hot Shutdown are required to isolate damaged cables and reestablish control locally for the Condensate Transfer Pump.	Condensate Transfer Pump 1-2	TB-FZ-11B TB-FZ-11E	Local Shutdown Panels used to control equipment as follows: LSP-1B32 Condensate Transfer Pump 1-2 (Operate transfer switch to "Alternate" and operate Control Switch for Condensate Transfer Pump 1-2)	MT-FA-12
5	Manual actions for Hot Shutdown are required to isolate damaged cables and reestablish control locally for Emergency Diesel Generator #2 (EDG2).	LSP-DG2	TB-FZ-11D, TB-FZ-11E	Local Shutdown Panels are used to control equipment as follows: LSP-DG2, EDG2 and its Switchgear (Operate transfer Switches (3 total) to "Alternate" and operate Control Switch on Diesel Panel to start diesel).	DG-FA-17
6	Manual actions for Hot Shutdown are required to re-close Breaker 062C of USS-1B3	USS-1B3 Breaker 062C	TB-FA-26 TB-FZ-11B TB-FZ-11C TB-FZ-11D TB-FZ-11E	Re-close MCC 1B32 Feeder Breaker at USS 1B3 after Diesel Generator start due to an undervoltage trip.	CW-FA-14

OMA Number	Purpose	Fire Affected Component	Initiating Fire Area	Actions	Action Location
7	Manual actions for Hot Shutdown are required to align the Fire System water to the Isolation Condenser shell side This action is required because there is no power ("B" Train) available to the Condensate Transfer System or makeup.	V-9-2099	OB-FZ-6B OB-FZ-8A OB-FZ-8B OB-FZ-8C TB-FZ-11F TB-FZ-11H CW-FA-14	Manual valves V-9-2099 (formerly V-11-44 and V-11-49) are opened, and manual valves V-11-63 and V-11-41 are closed to provide makeup.	RB-FZ-1E
8	Manual actions for Hot Shutdown are required to isolate damaged cables and reestablish control locally for Unit Substation (USS) 1A2 electrical breakers	Unit Substation (USS) 1A2 electrical breakers	OB-FZ-8C	Local Shutdown Panels used to control equipment as follows: LSP-1A2, CRD Hydraulic PP NC08A and 480V USS 1A2 Incoming breaker (Operate transfer switch to "Alternate" and operate Control Switch for USS-1A2 Main Breaker 1A2M and A CRD Pump).	OB-FZ-6A
9	Manual actions for Hot Shutdown are required to isolate damaged cables and reestablish control locally for Unit Substation (USS) 1B2 electrical breakers and CRD Hydraulic.	Unit Substation (USS) 1B2 electrical breakers and CRD Hydraulic Pump.	OB-FZ-6A	Remote Shutdown Panel used to control equipment: RSP, CRD Hydraulic PP NC08B and 480V USS 1B2 Incoming breaker as follows: Operate USS 1B2/CRD Transfer Switch (Partial initiation) to "Alternate" and operate Control Switches for USS-1B2 Main Breaker and B CRD Pump.	OB-FZ-6B

OMA Number	Purpose	Fire Affected Component	Initiating Fire Area	Actions	Action Location
11	Manual actions for Hot Shutdown are required to determine CRD flow.	Cables associated with the CRD Flow Indicator in CR	RB-FZ-1E RB-FZ-1G	Use CRD local flow gauge FI-225-998 due to cable damage to the normal control room flow indicator.	RB-FZ-1D
12	Manual actions for Hot Shutdown are required to establish CRD flow to the reactor due to the loss of instrument air to the CRD flow control valve.	Instrument air to the CRD Flow Control Valve The normal CRD flow control valve is a single component and does not have a redundant counterpart available for use from the control room. This valve may fail to operate due to control or power cable damage, or due to the fire-induced loss of instrument air.	RB-FZ-1D RB-FZ-1F5 TB-FA-3A OB-FZ-6A OB-FZ-6B OB-FZ-8A OB-FZ-8B OB-FZ-8C OB-FZ-10A OB-FA-9 RB-FZ-1E RB-FZ-1G TB-FA-26 TB-FZ-11B TB-FZ-11C TB-FZ-11D TB-FZ-11E TB-FZ-11F TB-FZ-11H CW-FA-14	Manually open V-15-237, throttle V-15-30 using local flow indicator (FI-225-2) and close V-15-52 to establish CRD flow to Reactor due to the loss of instrument air to the CRD Flow Control Valve	RB-FZ-1E The operator must re-enter Fire Zone RB-FZ-1E. To manually manipulate CRD System valves V-15-237, V-15-30 and V-15-52. These valves are physically located within the spray area of the automatic localized fixed water spray deluge system in this fire zone which is actuated by a cross-zoned fire detection system. An exemption was granted in SER dated June 25, 1990 for not providing either additional separation from in-situ combustibles or protection for CRD System valve V-15-30. Valves V-15-237, V-15-52 and V-15-30 are physically within four feet of each other; therefore, the technical basis of the exemption is considered to be equally valid for these additional valves. In addition, there are 204 minutes between the start of the event and when the actions need to occur to restore CRD flow.

OMA Number	Purpose	Fire Affected Component	Initiating Fire Area	Actions	Action Location
13	Provide Reactor Coolant Makeup using Core Spray Pump instead of the CRD Pump	Both CRD Pumps	RB-FZ-1F3	Core Spray System II manual valves V-20-1 and V-20-2 are opened and V-20-4 is closed to provide Reactor Coolant Makeup using Core Spray Pump instead of the CRD Pump (manipulate valves to align Core Spray to CST). This action is required because the fire damages both CRD Pumps.	RB-FZ-1F2
16	All Reactor Recirculation Pumps must be tripped to allow use of fuel zone level instruments and to prevent the Isolation Condenser from tripping on high flow.	Reactor Recirculation Pumps (NG01-A, NG01-B, NG01-C, NG01D and NG01E)	TB-FZ-11B TB-FZ-11E OB-FZ-8C	Trip all five Reactor Recirculation Pumps at 4160V Switchgear. 1A Breakers A3, A5 and A9 and Switchgear. 1B Breakers B4 and B8 Also, lockout the 4160V breakers using the 69 Switch.	TB-FZ-11C