The Detroit Edison Company
One Energy Plaza, Detroit, MI 48226-1279

10 CFR 52.79

April 16, 2010
NRC3-10-0016

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

References:
1) Fermi 3
Docket No. 52-033
2) Letter from Jerry Hale (USNRC) to Jack M. Davis (Detroit Edison), "Request for Additional Information Letter No. 25 Related to the SRP Sections 13.03 and 17.5 for the Fermi 3 Combined License Application," dated March 2, 2010
3) Letter from Peter W. Smith (Detroit Edison) to U.S. Nuclear Regulatory Commission, "Detroit Edison Company Response to NRC Request for Additional Information Letter No. 9," dated October 14, 2009
4) Letter from Peter W. Smith (Detroit Edison) to U.S. Nuclear Regulatory Commission, "Detroit Edison Company Response to NRC Request for Additional Information Letter No. 10," dated September 30, 2009
5) Letter from Ilka T. Berrios (USNRC) to Jack M. Davis (Detroit Edison), "Request for Additional Information Letter No. 19 Related to the SRP Sections 2.4.2, 2.4.3, 2.4.5, 2.4.6 AND 2.4.13 for the Fermi 3 Combined License Application," dated December 8, 2009
6) Letter from Peter W. Smith (Detroit Edison) to USNRC, "Detroit Edison Company Response to NRC Request for Additional Information Letter No. 19", dated January 29, 2010

Subject: Detroit Edison Company Response to NRC Request for Additional Information Letter No. 25

In Reference 2, the NRC requested additional information to support the review of certain portions of the Fermi 3 Combined License Application (COLA). In Reference 3, Detroit Edison provided the responses to RAIs related to Emergency Plan Evacuation Time Estimates (ETE) and submitted a revised ETE report. In Reference 4, Detroit Edison provided the responses to RAIs related to the Quality Assurance Program Description (QAPD).

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This letter transmits a supplemental response to NRC RAI Letter No. 19, Reference 5. Based on discussions with NRC staff on February 25, 2010, it was determined that the analysis presented in Reference 6 should be incorporated into the Fermi 3 COLA. Attachment 14 contains proposed COLA markups associated with RAI Letter No. 19 responses.

Attachment 15 is a CD containing the Fermi 3 ETE report, Revision 2, dated April 2010 and lists the file contained on the CD. This file complies with NRC instructions for electronic filing. Appropriate pre-submission checks have been successfully performed on the file to ensure conformance with the NRC guidelines and the file has been found acceptable for electronic submittal.

Information contained in these responses will be incorporated in a future COLA submission as described in the RAI response.

If you have any questions, or need additional information, please contact me at (313) 235-3341.

I state under penalty of perjury that the foregoing is true and correct. Executed on the 16th day of April 2010.

Sincerely,

Peter W. Smith, Director
Nuclear Development – Licensing and Engineering
Detroit Edison Company

Attachments:
1) Response to RAI Letter No. 25 (RAI Question 13.03-36)
2) Response to RAI Letter No. 25 (RAI Question 13.03-37)
3) Response to RAI Letter No. 25 (RAI Question 13.03-38)
4) Response to RAI Letter No. 25 (RAI Question 13.03-39)
5) Response to RAI Letter No. 25 (RAI Question 13.03-40)
6) Response to RAI Letter No. 25 (RAI Question 13.03-41)
7) Response to RAI Letter No. 25 (RAI Question 17.5-9)
8) Response to RAI Letter No. 25 (RAI Question 17.5-10)
9) Response to RAI Letter No. 25 (RAI Question 17.5-11)
10) Response to RAI Letter No. 25 (RAI Question 17.5-12)
11) Response to RAI Letter No. 25 (RAI Question 17.5-13)
12) Response to RAI Letter No. 25 (RAI Question 17.5-14)
13) Response to RAI Letter No. 25 (RAI Question 17.5-15)
14) Supplemental Response to RAI Letter No. 19
15) CD Containing the report "Fermi Nuclear Power Plant, Development of Evacuation Time Estimates", Rev. 2, dated April, 2010

cc: Jerry Hale, NRC Fermi 3 Project Manager (w/o attachments, w/CD)
Chandu Patel, NRC Fermi 3 Project Manager (w/o attachments)
Ilka Berrios, NRC Fermi 3 Project Manager (w/o attachments)
Bruce Olson, NRC Fermi 3 Environmental Project Manager (w/o attachments)
Fermi 2 Resident Inspector (w/o attachments)
NRC Region III Regional Administrator (w/o attachments)
NRC Region II Regional Administrator (w/o attachments)
Supervisor, Electric Operators, Michigan Public Service Commission (w/o attachments)
Michigan Department of Environmental Quality
Radiological Protection and Medical Waste Section (w/o attachments)

Attachment 1
NRC3-10-0016

Response to RAI Letter No. 25
(eRAI Tracking No. 4339)

RAI Question No. 13.03-36

NRC RAI 13.03-36

Supplemental RAI 13.03-01: Subject: ETE General Assumptions

In response to RAI 13.03-2 the applicant stated that Assumption 3b will be revised to state that all households in the EPZ with at least one commuter will await the return of the commuter before beginning their evacuation. Additional revisions to the ETE are necessary to address the full impact of this change in percentage. For example Sections 5 and 8.1 still indicate that 45 percent of households with commuters will not await the return of commuters prior to evacuating. Revise all applicable sections of the ETE Report to reflect the revised assumption that all households with commuters will await the return of the commuter prior to evacuating, or provide a justification for why this is not needed.

Response

The original response to RAI 13.03-2 was submitted in Detroit Edison letter NRC3-09-0033 (ML092931167), dated October 14, 2009.

As discussed in Detroit Edison's response to RAI 13.03-2, the findings of NUREG/CR-6953, Vol. 2 indicate that the family tends to evacuate together. Based on this information, the data provided on page F-7 of the ETE report indicating that 55 percent of households await the return of commuters was not used in the ETE study. Rather, 100 percent of households with at least one commuter (62% of EPZ households according to Figure F-6 of the ETE report) awaited the return of the commuter. This is reflected in the percentages provided for midweek scenarios in Table 6-3 of the ETE report. Text has been added to page F-7 to indicate that the 55 percent data obtained in the telephone survey was not used in the ETE study.

The discussion presented in Section 8.1 indicating that some evacuees may be transit dependent because a commuter is using the household vehicle and may not return home does indeed conflict with the assumption that 100 percent of households with at least one commuter will await the return of the commuter prior to beginning their evacuation trip. As such, Section 8.1 and Table 8-1 have been revised to reflect the assumption that all commuters will return home. Eliminating those households with non-returning commuters from the equation on page 8-3 of the ETE report reduces the number of buses needed to evacuate the transit-dependent population from 100 buses to 42 buses. Tables 6-4, 8-6, 8-7A and 8-7B will be revised to reflect the correct number of buses.

The revisions made to Section 8.1 result in a reduction of 58 buses. As noted in the footnote to Table 6-4 of the ETE report and in the second paragraph on page 8-1 of the ETE report, one bus is modeled as 2 passenger car equivalents. Thus, the revisions made to Section 8.1 result in a reduction of 116 vehicles. Based on the data provided in Table 6-4 of Revision 1 of the ETE report, the average number of vehicles evacuating the EPZ across all scenarios is approximately 75,000 vehicles. Therefore, the reduction in buses for the transit dependent population represents less than 1% (116÷75,000=0.15%) of the evacuating traffic stream. This small change in the evacuating traffic stream will not impact ETE values. As a result, the DYNEV simulations were not rerun based on this change.

Proposed COLA Revision

The following changes are presented in the "Fermi Nuclear Power Plant Development of Evacuation Time Estimates Report" Revision 2 contained in Attachment 15.

1. Added the following sentences to the end of page F-7:

   This data was not used in this study. The findings of NUREG/CR-6953, Vol. 2 indicate that the family tends to evacuate together. Based on this information, it is assumed for this study that 100 percent of households with at least one commuter (62% of EPZ households according to Figure F-6) await the return of the commuter before beginning their evacuation trip.

2. Revised Section 8.1 as shown in Enclosure 1.

3. Revised Section 8.5 as shown in Enclosure 1 to the response to RAI 13.03-37.

4. Revised Table 8-1 as shown in Enclosure 2.

5. Revised Table 6-4 as shown in Enclosure 3.

6. Revised Table 8-6 as shown in Enclosure 4.

7. Revised Tables 8-7A and 8-7B as shown in Enclosure 1 to the response to RAI 13.03-40.

8. Revised the third paragraph on page 8-7 of Rev. 1 as follows:

   Routes 1 through 4 service the City of Monroe, which accounts for nearly half of the EPZ population. The transit dependent population is expected to be highest in this area, thus the majority of the buses are allocated to the City of Monroe. The buses on these routes have been spaced at 3 minute headways with the first bus arriving at the route at 90 minutes after the ATE and the last bus arriving at ~~150~~ 114 minutes after the ATE. The use of bus headways is intended to provide a more robust service by servicing those transit-dependent persons that may need more time to mobilize.

Enclosure 1

RAI Question 13.03-36

Revised: Section 8.1 "Transit-Dependent People – Demand Estimate"
(following 2 page(s))

8.1 Transit-Dependent People - Demand Estimate

The telephone survey (see Appendix F) results for persons in households that do not have a vehicle available were used to estimate the portion of the population requiring transit service~~:~~

~~Those persons in households that do not have a vehicle available.~~

~~Those persons in households that do have vehicle(s) that would not be available at the time the evacuation is ordered.~~

~~In the latter group, the vehicle(s) may be used by a commuter(s) who does not return (or is not expected to return) home to evacuate the household.~~

Table 8-1 presents estimates of transit-dependent people. Note:

Estimates of persons requiring transit vehicles include school children. For those evacuation scenarios where children are at school when an evacuation is ordered, separate transportation is provided for the school children. The actual need for transit vehicles by residents is thereby less than the given estimates. However, we will not reduce our estimates of transit vehicles since it would add to the complexity of the implementation procedures.

It is reasonable and appropriate to consider that many transit-dependent persons will evacuate by ride-sharing with neighbors, friends or family. For example, nearly 80 percent of those who did not use their own cars to evacuate from Mississauga, Ontario, shared a ride with neighbors or friends. Other documents report that approximately 70 percent of transit-dependent persons were evacuated via ride-sharing. **We will adopt a conservative estimate that 50 percent of transit-dependent persons will ride-share.**

The estimated number of bus trips needed to service transit-dependent persons is based on an estimate of average bus occupancy of 30 persons at the conclusion of the bus run. Transit vehicle seating capacities typically equal or exceed 60 children (equivalent to 40 adults). If transit vehicle evacuees are two-thirds adults and one-third children, then the number of "adult seats" taken by 30 persons is 20 + (2/3 x10) = 27. On this basis, the average load factor anticipated is (27/40) x 100 = 68 percent. Thus, if the actual demand for service exceeds the estimates of Table 8-1 by 50 percent, the demand for service can still be accommodated by the available bus seating capacity.

Table 8-1 indicates that transportation must be provided for ~~2,986~~ 1,253 people. Therefore, a total of ~~100~~ 42 bus runs are required to transport this population to reception centers.

To illustrate this estimation procedure, we calculate the number of persons, P, requiring public transit or ride-share, and the number of buses, B, required for the Fermi EPZ:

$P =$ 38,000 × 0.042 × .57 ~~+).245 × 1.87 −) ×).62 ×).45 +).491 × 2.83 − !) × 0.62 ×).45)²)~~

$P =$ 38,000 × ~~0.1571) = ;,972~~ <u>(0.06594) = 2,506</u>

$B =$ (0.5 × P) ÷ ;0 = ~~00~~ <u>42</u>

These calculations are explained as follows:

> All members (1.57 avg.) of households (HH) with no vehicles (4.2%) will evacuate by public transit or ride-share. The term 38,000 (total households) x 0.042 x 1.87, accounts for these people.
> ~~The members of HH with 1 vehicle away (24.5%), who are at home, equal (1.87-1). The number of HH where the commuter will not return home is equal to (38,000 x 0.245 x 0.62 x 0.45), given that 62% of the households in the EPZ have at least one commuter, 45% of which will not wait for the commuter to return before evacuating. The number of persons who will evacuate by public transit or ride-share is equal to the product of these two terms.~~
> ~~The members of HH with 2 vehicles that are away (49.1%), who are at home, equal (2.83 – 2). The number of HH where neither commuter will return home is equal to 38,000 x 0.491 x (0.62 x 0.45)². The number of persons who will evacuate by public transit or ride-share is equal to the product of these two terms.~~
> Households with ~~3~~ <u>1</u> or more vehicles are assumed to have no need for transit vehicles.
> ~~The total number of persons requiring public transit is the sum of such people in HH with no vehicles, or with 1 or 2 vehicles that are away from home.~~

Enclosure 2

RAI Question 13.03-36

Revised: Table 8-1 "Transit Dependent Population Estimates"

Table 8-1. Transit Dependent Population Estimates

Facility Name	2008 EPZ Population	Survey Average Household Size With ~~Indicated No. of~~ 0 Vehicles			Estimated Number of Households	Survey Percent Households With 0 Vehicles			Survey Percent Households With Commuters	~~Survey Percent Households With Non-Returning Commuters~~	Total People Requiring Transport	Estimated Ridesharing Percentage	People Requiring Public Transit	Percent of Population Requiring Public Transit
		~~0~~	~~1~~	~~2~~		~~0 Vehicle~~	~~1 Vehicle~~	~~2 Vehicle~~						
Fermi Nuclear Power Plant	103,343	1.57	~~1.87~~	~~2.83~~	38,000	4.2%	~~24.5%~~	~~49.1%~~	62%	~~45%~~	~~5,972~~2,506	50%	~~2,986~~1,253	~~2.9%~~1.2%

Enclosure 3

RAI Question 13.03-36

Revised: Table 6-1 "Vehicle Estimates by Scenario"

Table 6-4. Vehicle Estimates by Scenario											
Scenarios	Residents with Commuters	Residents without Commuters	Employees	Transients	Shadow	Special Event 1	Special Event 2	School Buses*	Transit Buses*	External Traffic	Total Scenario Vehicles
1	29,283	17,830	4,751	2,562	15,258	-	-	77	~~200~~84	7,500	~~77,461~~77,345
2	29,283	17,830	4,751	2,562	15,258	-	-	77	~~200~~84	7,500	~~77,461~~77,345
3	2,928	44,185	495	6,405	14,006	-	-	-	~~200~~84	7,500	~~75,719~~75,603
4	2,928	44,185	495	6,405	14,006	-	-	-	~~200~~84	7,500	~~75,719~~75,603
5	2,928	44,185	742	1,601	14,078	-	-	-	~~200~~84	3,000	~~66,734~~66,618
6	29,283	17,830	4,949	961	15,316	-	-	766	~~200~~84	7,500	~~76,805~~76,689
7	29,283	17,830	4,949	961	15,316	-	-	766	~~200~~84	7,500	~~76,805~~76,689
8	29,283	17,830	4,949	961	15,316	-	-	766	~~200~~84	7,500	~~76,805~~76,689
9	2,928	44,185	495	1,601	14,006	-	-	-	~~200~~84	7,500	~~70,915~~70,799
10	2,928	44,185	495	1,601	14,006	-	-	-	~~200~~84	7,500	~~70,915~~70,799
11	2,928	44,185	495	1,601	14,006	-	-	-	~~200~~84	7,500	~~70,915~~70,799
12	2,928	44,185	742	641	14,078	-	-	-	~~200~~84	3,000	~~65,774~~65,658
13	2,928	44,185	495	6,405	14,006	4,450	-	-	~~200~~84	7,500	~~80,169~~80,053
14	34,003**	20,715**	4,751	2,562**	16,996	-	2,160	77	~~200~~84	7,500	~~88,964~~88,848

Enclosure 4

RAI Question 13.03-36

Revised: Table 8-6 "Summary of Transit Dependent Bus Routes"

Table 8-6. Summary of Transit Dependent Bus Routes

Route Number	Number of Buses	Route Description	Length (mi.)
1	~~20~~8	Eastbound on Stoney Creek Rd to Michigan Highway 125. South on Michigan Highway 125 through Monroe and out of the EPZ.	12.5
2	~~20~~8	Eastbound on Bluebush Rd to US Highway 24. South on US Highway 24 through Monroe and out of the EPZ.	8.9
3	~~20~~8	Eastbound on Bluebush Rd to US Highway 24. South on US Highway 24 to North Custer Rd. West on North Custer Rd through Monroe and out of the EPZ.	9.1
4	~~20~~8	Northbound on Interstate 75. Exit for Front Street. West on Front Street through Monroe and out of the EPZ.	9.4
5	~~5~~3	Southbound on Interstate 275. Exit for Carleton-Rockwood Rd. West on Carleton-Rockwood Rd, through Carleton to Exeter Rd. North on Exeter Rd out of the EPZ.	7.3
6	~~10~~4	Southbound on US Highway 24 to East Huron River Dr. East on East Huron River Dr to Jefferson Ave. North on Jefferson Ave out of the EPZ.	10.2
7	~~5~~3	Southbound on Allen Road to Gibraltar Rd. West on Gibraltar Rd to US Highway 24. North on US Highway 24 out of the EPZ.	5.9

Attachment 2
NRC3-10-0016

Response to RAI Letter No. 25
(eRAI Tracking No. 4339)

RAI Question No. 13.03-37

NRC RAI 13.03-37

Supplemental RAI 13.03-02: Subject: Demand Estimation, Permanent Residents

The applicant's response to RAI 13.03-4, discusses use of bus and van service for wheelchair bound residents implying that both types of vehicles will be used. The response also implies that only buses are used in an evacuation. Explain if vans are used, and identify the number and capacity of buses and vans used to support the evacuation of special needs individuals who are also transit dependent. Update the ETE document accordingly, or provide a justification for why this is not needed.

Response

The original response to RAI 13.03-4 was submitted in Detroit Edison letter NRC3-09-0033 (ML092931167), dated October 14, 2009.

Based on discussions with emergency management personnel from Monroe and Wayne counties, regular buses and specially equipped buses will be used to service wheelchair bound residents within the EPZ.

The following wheelchair transit resources are available to the EPZ counties:

- Monroe County Schools have 31 specially equipped buses with a total capacity of 89 wheelchair-bound individuals
- An additional 5 specially equipped buses with a total capacity of 10 wheelchair-bound individuals are available in Toledo, Ohio. These resources would take approximately an hour to arrive within the EPZ.
- There are 82 ambulances available from 10 private ambulance companies within Wayne County. These ambulances are capable of transporting a wheelchair bound person using a rigid wheelchair.

It is assumed for this study that 50% of wheelchairs are rigid and 50% of wheelchairs are folding. Those wheelchair-bound persons using folding wheelchairs can be evacuated in a standard bus and their wheelchair can be folded and placed in the rear of the bus or in the seat adjacent to the seat they are sitting in. Those wheelchair-bound persons using rigid wheelchairs will need to be evacuated in specially equipped buses. Sections 8.4 and 8.5 of the ETE report are revised accordingly.

Proposed COLA Revision

The following changes are presented in the "Fermi Nuclear Power Plant Development of Evacuation Time Estimates Report" Revision 2 contained in Attachment 15.

1. Revised Section 8.5 as shown in Enclosure 1.

2. Revised Section 8.3 as follows:

   Table 8-4 presents the census of special facilities in the EPZ as of May, 2008. Approximately 950 people have been identified as living in, or being treated in, these facilities. This census also indicates the number of wheelchair-bound people and the number of bed-ridden people. The transportation requirements for this group are also presented. The number of ambulance runs is determined by assuming that 2 patients can be accommodated per ambulance trip; the number of ~~wheelchair van~~ specially equipped bus runs ~~assumes 4 wheelchairs per trip~~ is based on the data presented in Table 8-10; ~~wheelchair~~ buses can transport 15 folding wheelchair patients, and the number of bus runs estimated assumes 30 ambulatory patients per trip.

3. Added Table 8-10, "Wheelchair Transit Resources Available" to the end of Section 8 as shown in Enclosure 2.

4. Revised Section 8.4, sub-section "Evacuation of Ambulatory Persons from Special Facilities" as shown in Enclosure 3.

5. Revised Table 8-4, "Special Facility Transit Demand" as shown in Enclosure 4.

6. Added Tables 8-11A and 8-11B "Special Facilities Folding Wheelchair Evacuation Time Estimates" to the end of Section 8 as shown in Enclosure 5.

7. Added Tables 8-12A and 8-12B, "Special Facilities Rigid Wheelchair Evacuation Time Estimates" to the end of Section 8 as shown in Enclosure 6.

8. Revised "Medical Facilities" sub-section of Section 3 as follows:

   There are several medical facilities in the EPZ. Chapter 8 details the evacuation time estimate for the patients residing in these facilities. The number and type of evacuating vehicles that need to be provided depends on the state of health of the patients. Buses can transport up to ~~40 people~~ 30 ambulatory patients or 15 wheelchair bound patients with folding wheelchairs; ~~vans~~ specially equipped buses, ~~up to~~ ~~12 people~~ varies as shown in Table 8-10; ambulances, up to 2 ~~people (patients)~~ bedridden patients or 1 wheelchair bound patient with a rigid wheelchair.

9. Add the following assumption to Section 2.3:

   It is assumed that half of the wheelchair bound persons in the EPZ use rigid wheelchairs while the other half use folding wheelchairs. Those wheelchair-bound persons using folding wheelchairs can be evacuated in a standard bus and their wheelchair can be folded and placed in the rear of the bus or in the seat adjacent to the seat they are sitting in. Those wheelchair-bound persons using rigid wheelchairs will need to be evacuated in specially equipped buses.

10. Added Tables 8-10, 8-11A, 8-11B, 8-12A and 8-12B to page vi of the Table of Contents as shown in Enclosure 7.

11. Added Tables 8-11A (as shown in Enclosure 5) and 8-12A (as shown in Enclosure 6) to the end of the Executive Summary.

12. Added the following bullets to the end of page ES-4 in the Executive Summary:

    - Table 8-11A provides the ETE for medical facility residents using folding wheelchairs in good weather.
    - Table 8-12A provides the ETE for medical facility residents using rigid wheelchairs in good weather.

Enclosure 1

RAI Question 13.03-37

Revised: "Section 8.5 Evacuation of Homebound Special Needs Population"
(following 3 page(s))

8.5 Evacuation of Homebound Special Needs Population

It is the responsibility of the Off-site Response Organizations (ORO) to compile an "Evacuation Registry" for the people within the EPZ. The back flap of the 2007-2008 "Emergency Preparedness for Monroe and Wayne Counties" public information booklet provides registration cards for homebound (not in a special facility) special needs population, including "wheelchair disabled" persons and those persons "confined to bed." The findings of the recent NRC public telephone survey[1] indicate that special needs registration data are not reliable, as approximately two-thirds of special needs people do not register with their local emergency response agency.

The National Organization on Disability (NOD) discusses locating people with special needs in neighborhoods in the United States at the below listed site:

(www.nod.org/index.cfm?fuseaction=Feature.showFeature&FeatureID=1100)

Additionally, privacy concerns can impede the efforts of ORO agencies; confidentiality must be assured to encourage caretakers to register.

Given these limitations, the ETE for the homebound special needs population was computed as follows:

- Estimate that 15% of non-institutionalized transit-dependent persons have a disability. This is based on the 2006 American Community Survey (ACS), U.S. Census Bureau.
- Disabilities include Sensory (4.3%); Physical (4.4%); Mental (5.8%); Self-care (3.0%). (Note: This adds to more than 15% due to multiple disabilities)
- Assume caretakers are available to the extent that one-fifth of persons with disabilities can evacuate with transit dependent persons without disabilities, using transit vehicles on routes. This leaves 12% of this population to be picked up at home. As shown in Table 8-1, it is estimated that there are ~~2,986~~ 1,253 transit-dependent persons in the EPZ, which includes homebound special needs persons.
- Estimate population requiring transit pickup:
    a. 8% of this population for bus service (0.08 x ~~2986~~1253 = ~~240~~ 100 persons and ~~240~~ 100 caretakers);
    b. 3% of this population for ~~van~~ specially equipped bus service (~~90~~ 40 persons plus ~~90~~ 40 caretakers), and
    c. 1% of this population for ambulance service (~~30~~ 13 persons with ~~30~~ 13 caretakers).
- ~~Since vans are in short supply, assume buses will be used with passengers limited to a total of 18 to allow room for the folded wheel chairs and other support equipment.~~ Standard buses will be used to transport those wheelchair bound persons with folding wheelchairs, while specially equipped buses will be used to transport those wheelchair bound persons with rigid wheelchairs. It is assumed that half of the wheelchair bound persons use folding wheelchairs and half use rigid. Thus, 20 persons plus 20 caretakers

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[1] Jones, J., et. al. Review of NUREG-0654, Supplement 3, "Criteria for Protective Action Recommendations for Severe Accidents" - Focus Groups and Telephone Survey, NUREG/CR-6953, Vol. 2, Sandia National Laboratories, Pages viii, ix and 33.

will be evacuated using standard buses and 20 persons plus 20 caretakers will be evacuated using specially equipped buses. Wheelchair bus capacity is 15 persons plus wheelchairs, while specially equipped bus capacity is 4 persons plus wheelchairs plus 4 caretakers.

- The vehicle requirements would be:
  a. Bus Service - ~~16~~ 10 bus trips, ~~30~~ 20 persons per trip, or ~~15~~ 10 stops per trip
  b. Wheelchair Bus Service – 3 bus trips, 7 persons plus wheelchairs plus 7 caretakers per trip, or 7 stops per trip
  c. ~~Van~~ Specially Equipped Bus Service - ~~10 bus~~ 5 bus trips, ~~18~~ 4 persons plus wheel chairs plus 4 caretakers per trip, or ~~9~~ 4 stops per trip
  d. Ambulance Service - ~~15~~ 7 ambulance trips, 2 persons plus caretakers per trip, or 2 stops per trip
- The associated ETE depends in part on the time after the ATE that the vehicles become available. It is reasonable to expect that the buses that have evacuated the school children for the midweek, winter scenarios will return to the EPZ to transport the special needs persons in a single wave. In good weather these buses will arrive at the host schools at an average ETE of 1:25 (1 hr 25 min) (see Table 8-5A). Allowing 30 minutes for the buses to unload, for the drivers to rest and for the return trip to the EPZ, the first pick-up should occur at 1:55 (1 hr 55 min).

  a. Bus Service - Estimating travel at 15 mph over a one-mile distance separating stops (4 minutes travel time), on average, and one minute to board two persons, yields 5 minutes per stop. Since there are ~~14~~ 9 stops after the first, a total of ~~70~~ 45 minutes are required to complete the pickup of ~~30~~ 20 persons. The last pick-up is completed at 1:55 + ~~1:10~~0:45 = ~~3:05~~ 2:40 (~~3~~ 2 hr ~~5~~ 40 min). Adding travel time to the EPZ boundary (5 miles @ 15 mph) yields an ETE = **~~3:25~~ 3:00** (3 hr ~~25 min~~).

     For rain, the average ETE to host schools is 1:50 (1 hr 50 min) (see Table 8-5B), assume 10 additional minutes needed for unloading, driver rest and return trip to EPZ, and allowing 6 minutes per stop at 12 mph yields an ETE of:
     1:50 + 40 + ~~14~~ 9 x 6 + 5mi @ 12 mph = **~~4:20~~ 3:50** (4 3 hr ~~20~~ 50 min)

  b. Wheelchair Bus~~Van~~ Service - Compared with the ~~16~~ 10 bus trips analyzed above, these ~~10~~ 3 buses are estimated to spend six (6) minutes at each stop to board a non-ambulatory person and to secure a wheel chair. This yields 10 minutes per stop, or ~~8~~ 6 x 10 + 6 minutes from the bus arrival at the first stop until completion of boarding at the ~~ninth~~ seventh and last stop. Then the ETE is estimated at 1:55 + ~~1:26~~ 1:06 + 0:20 (5 miles @ 15 mph) = **~~3:40~~ 3:20** (3 hr ~~40~~ 20 min). For rain, allowing 12 minutes per stop, the ETE is 1:50 + 0:40 + ~~8~~ 6 x 12 + 6 + 5mi @ 12mph = **~~4:35~~ 4:15** (4 hr ~~35~~ 15 min).

  c. Specially Equipped Bus Service – These 5 specially equipped buses are also assumed to travel at 15 mph over a one-mile distance separating stops (4 minutes travel time) and are estimated to spend 6 minutes at each stop to board a non-ambulatory person and to secure a wheel chair. This yields a total of 40 minutes for the 4 stops serviced by each specially equipped bus. The vehicles servicing these people will be resources from Bedford Schools (see Table 8-10). It is estimated that 60 minutes will be needed to mobilize these resources. The ETE for these vehicles is estimated at 1:00 + 0:40 + 5mi @ 15mph = 2:00 (2 hr). For rain, allowing 12 minutes per stop, the ETE is 1:00 + 0:48 + 5 mi @ 12mph = 2:15 (2 hr 15 min).

d. Ambulance Service - Allowing about 15 minutes at each stop and assuming that the ambulances are those that completed their first trip at 1:10 (see average ETE in Table 8-13A), the ETE is estimated at 1:10 + 0:15 + 0:15 + 0:15 + 0:15 + 0:20 + 0:20 = **2:50** (2 hr 50 min). Here, 15 minutes are estimated to unload the ambulance at the host facility, 15 minute rest for driver, 15 minutes to return to EPZ and travel to first stop, 15 minutes to load patient, 20 minutes for second stop and 20 minutes to leave the EPZ. For rain, the ETE would be about **3:30** (3 hr 30 min).

- In general, the ETE for the special needs population is within that for 100% of the general population.
- For the ~~16~~ 10 bus trips servicing the ambulatory population, assuming ~~30~~ 20 persons per trip and for the ~~10~~ 3 bus trips servicing the wheelchair bound population, assuming ~~18~~ 14 persons plus wheel chairs per trip analyzed above, the ETE values presented will be reduced by 55 minutes (1:55 - 1:00 mobilization) if there is no need to evacuate school children.

Enclosure 2

RAI Question 13.03-37

Table 8-10 “Wheelchair Transit Resources Available”
(following 1 page(s))

Table 8-10. Wheelchair Transit Resources Available				
Vehicle Source	**Total Vehicles**	**Wheelchair Capacity of each Vehicle**	**Total Wheelchair Capacity**	**Assignment**
Monroe County (Specially Equipped Buses)				
Airport Schools	3	Various	12	Maplewood Manor (2), Medilodge II (1)
Jefferson Schools	3		9	Mercy Memorial Hospital
Bedford Schools	5		22	Homebound Special Needs
Mason Schools	2		3	ALCC
Dundee Schools	2		6	Tendercare of Monroe
Summerfield Schools	3		4	Lutheran Home
Monroe Schools	10		24	Mercy Memorial Hospital
Whiteford Schools	1		2	Mercy Memorial Hospital
Ida Schools	2		7	IHM Motherhouse
TOTAL	**31**		**89**	
Wayne County (Ambulances Provided by Private Ambulance Companies)				
East Side Med Star	6	1	6	Marybrook Residence (1), Surplus (5)
Community	13		13	Surplus
Concord	16		16	
HealthLink	5		5	
HVA	6		6	
Rapid Response	8		8	
Medic One	9		9	
Superior	6		6	
Universal (Macomb)	10		10	
Star EMS	3		3	
TOTAL	**82**		**82**	
Toledo, Ohio (Specially Equipped Buses)				
ProMedica	5	2	10	Surplus
TOTAL	**5**		**10**	
EPZ TOTAL	**118**		**181**	

Enclosure 3

RAI Question 13.03-37

Revised Sub-Section "Evacuation of Ambulatory Persons from Special Facilities"
(following 1 page(s))

Evacuation of Ambulatory Persons from Special Facilities

The bus operations for this group are similar to those for school evacuation except:

- Buses are assigned on the basis of 30 patients to allow for staff to accompany the patients.
- The passenger loading time will be longer at approximately one minute per patient to account for the time to move patients from inside the facility to the vehicles. For those facilities with more than 30 ambulatory patients, it is assumed that buses load concurrently and that loading time is equal to 30 minutes for the entire facility.

It is estimated that mobilization time averages 1 hour. In the event there is a shortfall of transit vehicles for a single wave evacuation, then buses used to evacuate schools will have to return to evacuate the special facilities for a "second wave" evacuation. The aforementioned bus route feature in the UNITES software was used to define bus routes along the most likely path from a special facility being evacuated to the EPZ boundary. The average speed along the route output by PC-DYNEV was used to calculate the route travel time; Tables 8-8A and 8-8B provide the ETE for a single and two wave evacuation for buses evacuating ambulatory persons from special facilities in good weather and rain, respectively. The routes input to UNITES for these facilities are documented in Table 8-9.

Evacuation of Wheelchair Bound Persons from Special Facilities

Table 8-4 indicates that 7 9 wheelchair standard bus runs and 11 27 wheelchair van specially equipped bus runs are needed for the to evacuate all of the wheelchair bound population within the entire EPZ. Wheelchair buses and vans are often scarce; however, regular buses can be used to transport wheelchair bound patients. Patients would occupy the front portion of the bus and their wheelchairs would be folded and stacked in the back of the bus. As stated in Section 2.3, it is assumed that half of the wheelchair bound persons in the EPZ use rigid wheelchairs while the other half use folding wheelchairs. Those wheelchair-bound persons using folding wheelchairs can be evacuated in a standard bus and their wheelchair can be folded and placed in the rear of the bus or in the seat adjacent to the seat they are sitting in. Those wheelchair-bound persons using rigid wheelchairs will need to be evacuated in specially equipped buses. Loading times are estimated at 5 minutes per wheelchair bound person as staff will have to assist them in boarding the bus. For those facilities with more than 15 (wheelchair bus capacity) wheelchair bound persons, it is assumed that buses load concurrently and that the loading time is equal to 75 minutes (15 x 5) for the entire facility. According to Table 8-10, there are 36 specially equipped buses available with a total wheelchair capacity of 99; thus, average capacity is 2.75 wheelchairs per vehicle. Based on a loading time of 5 minutes per person, a loading time of 15 minutes, on average, will be used for these vehicles.

The route travel time is the same as for buses evacuating ambulatory persons at the facilities, as provided in Tables 8-8A and 8-8B. For example, the route travel time for Maplewood Manor is 10 minutes; thus, the ETE for the wheelchair bound at this facility is:

ETE: 60 + 8 x 5 + 10 = 1:50.

The school ETE to the Host Schools is approximately 1:25 on average, and about 30 minutes of unloading, driver rest and inbound travel time to the special facility from the host school would be required. It follows, therefore, that about 55 minutes would have to be added to the calculated ETE for special facilities, in the event they are evacuated as a "second wave." Therefore, the "second wave" ETE for wheelchair bound residents at Maplewood Manor is approximately 2:45.

A mobilization time of 1 hour is estimated for standard buses and specially equipped buses needed to evacuate ambulatory and wheelchair bound persons from special facilities, with an additional 10 minutes needed in rain. The route travel time is computed using the aforementioned UNITES bus route feature and the route-specific speed output by DYNEV at the time the transit vehicle leaves the facility being evacuated. If there are not sufficient buses to evacuate schoolchildren and ambulatory patients and wheelchair bound patients from special facilities concurrently, a second wave evacuation will be needed. Those buses returning to perform a second wave evacuation of wheelchair bound and ambulatory patients would be the buses that evacuated the schoolchildren. As such, the mobilization time for these buses would be the sum of the time to arrive at the reception center, unload the bus, allow time for driver rest and return to the EPZ (all of which are taken from Table 8-5).

Tables 8-11A and 8-11B provide single-wave and two-wave ETE for buses evacuating wheelchair bound patients in good weather and rain, respectively. Tables 8-12A and 8-12B provide single-wave ETE for specially equipped buses evacuating wheelchair bound patients using rigid wheelchairs for good weather and for rain, respectively. As shown in Table 8-10, there are sufficient specially equipped bus resources available to evacuate those using rigid wheelchairs in a single wave.

The ETE for the ambulatory and wheelchair bound patients at special facilities, on average, do not exceed the 100th percentile ETE of the general population.

Enclosure 4

RAI Question 13.03-37

Table 8-4 "Special Facility Transit Demand"
(following 1 page(s))

Table 8-4. Special Facility Transit Demand

PAA	Facility Name	Municipality	Capacity	Current Census	Ambulatory Patients	Wheel - chair Bound	Bed Ridden	Ambu- lance Runs	Wheel- chair Bus Runs[2]	~~Wheel- chair Van~~ Specially Equipped Bus Runs[3]	Bus Runs *
				Monroe County							
5	ALCC	Monroe	21	12	6	6	0	0	~~0~~ 1	2	1
5	Alterra	Monroe	20	15	15	0	0	0	0	0	1
5	IHM Motherhouse	Monroe	210	192	177	13	2	1	1	~~0~~ 2	6
5	Lutheran Home	Monroe	115	115	106	8	1	1	~~0~~ 1	~~2~~ 3	4
5	Maplewood Manor	Monroe	120	110	101	8	1	1	~~0~~ 1	2	4
5	Medilodge II	Monroe	103	92	85	6	1	1	~~0~~ 1	~~2~~ 1	3
5	Mercy Memorial Hospital	Monroe	168	168	69	69	30	15	~~5~~ 3	~~0~~ 14	3
5	Mercy Memorial Nursing Center	Monroe	70	60	59	0	1	1	0	0	2
5	Tendercare of Monroe	Monroe	192	175	161	12	2	1	1	2	6
				Wayne County							
4	Marybrook Residence	Flat Rock	12	11	10	1	0	0	0	1	1
		EPZ Totals:	**1,031**	**950**	**789**	**123**	**38**	**21**	**~~7~~ 9**	**~~11~~ 27**	**31**

*The estimated bus runs can accommodate up to 40 patients each if population increases.

[2] It is assumed that half of the wheelchair bound residents use folding wheelchairs and can be evacuated using a standard bus with a capacity of 15 wheelchair bound persons.

[3] It is assumed that half of the wheelchair bound residents use rigid wheelchairs and must be evacuated using a specially equipped bus or ambulance. The capacity of these transit vehicles varies as indicated in Table 8-10. The assignment of available vehicles to these facilities is provided in Table 8-10.

Enclosure 5

RAI Question 13.03-37

"Table 8-11. Special Facilities Folding Wheelchair Evacuation Time Estimates"
(following 1 page(s))

Table 8-11A. Special Facilities Folding Wheelchair Evacuation Time Estimates - Good Weather																
	Single Wave							Second Wave								
Special Facility	Mobilization (min.)	Wheelchair Passengers	Loading Time (min.)	Route Length (mi.)	Average Speed (mph)	Route Travel Time (min.)	ETE (hr:min)	Arrive at RC (min.)	Unload (min.)	Driver Rest (min.)	Return to EPZ (min.)	Loading Time (min.)	Average Speed (mph)	Route Travel Time (min.)	ETE (hr:min)
Monroe County															
ALCC	60	3	15	7.2	42.8	10	01:25	85	5	10	16	15	42.8	10	02:25
IHM Motherhouse	60	6	30	3.4	8.2	25	01:55	85	5	10	16	30	4.3	48	03:15
Lutheran Home	60	4	20	5.0	6.9	44	02:05	85	5	10	16	20	4.1	73	03:30
Maplewood Manor	60	4	20	7.0	41.6	10	01:30	85	5	10	16	20	41.6	10	02:30
Medilodge II	60	3	15	3.4	10.2	20	01:35	85	5	10	16	15	4.6	45	03:00
Mercy Memorial Hospital	60	34	75	5.4	4.5	72	03:30	85	5	10	16	75	12.7	26	03:40
Tendercare of Monroe	60	6	30	4.1	7.5	32	02:05	85	5	10	16	30	4.7	52	03:20
						Maximum for EPZ:	03:30							Maximum for EPZ:	03:40
						Average for EPZ:	02:00							Average for EPZ:	03:05

Table 8-11B. Special Facilities Folding Wheelchair Evacuation Time Estimates - Rain															
	Single Wave							Second Wave							
Special Facility	Mobilization (min.)	Wheelchair Passengers	Loading Time (min.)	Route Length (mi.)	Average Speed (mph)	Route Travel Time (min.)	ETE (hr:min)	Arrive at RC (min.)	Unload (min.)	Driver Rest (min.)	Return to EPZ (min.)	Loading Time (min.)	Average Speed (mph)	Route Travel Time (min.)	ETE (hr:min)
Monroe County															
ALCC	70	3	15	7.2	38.7	11	01:40	110	5	10	18	15	38.7	11	02:50
IHM Motherhouse	70	6	30	3.4	4.5	46	02:30	110	5	10	18	30	4.0	52	03:45
Lutheran Home	70	4	20	5.0	4.4	68	02:40	110	5	10	18	20	3.4	89	04:15
Maplewood Manor	70	4	20	7.0	37.5	11	01:45	110	5	10	18	20	37.5	11	02:55
Medilodge II	70	3	15	3.4	5.6	36	02:05	110	5	10	18	15	5.3	39	03:20
Mercy Memorial Hospital	70	34	75	5.4	5.1	63	03:30	110	5	10	18	75	12.4	26	04:05
Tendercare of Monroe	70	6	30	4.1	4.3	57	02:40	110	5	10	18	30	5.0	49	03:45
						Maximum for EPZ:	03:30							Maximum for EPZ:	04:15
						Average for EPZ:	02:25							Average for EPZ:	03:35

Enclosure 6

RAI Question 13.03-37

"Table 8-12. Special Facilities Rigid Wheelchair Evacuation Time Estimates"
(following 2 page(s))

Table 8-12A. Special Facilities Rigid Wheelchair Evacuation Time Estimates - Good Weather							
Special Facility	**Mobilization Time (min.)**	**Wheelchair Passengers**	**Loading Time (min.)**	**Route Length (mi.)**	**Average Speed (mph)**	**Route Travel Time (min.)**	**ETE (hr:min)**
Monroe County							
ALCC	60	3	15	7.2	42.8	10	**1:25**
IHM Motherhouse	60	7	15	3.4	9.6	21	**1:40**
Lutheran Home	60	4	15	5.0	6.9	44	**2:00**
Maplewood Manor	60	4	15	7.0	41.6	10	**1:25**
Medilodge II	60	3	15	3.4	10.2	20	**1:35**
Mercy Memorial Hospital	60	35	15	5.4	8.1	40	**1:55**
Tendercare of Monroe	60	6	15	4.1	11.6	21	**1:40**
Wayne County							
Marybrook Residence	60	1	5	4.6	17.5	16	**1:25**
						Maximum for EPZ:	**2:00**
						Average for EPZ:	**1:40**

Table 8-12B. Special Facilities Rigid Wheelchair Evacuation Time Estimates - Rain							
Special Facility	**Mobilization Time (min.)**	**Wheelchair Passengers**	**Loading Time (min.)**	**Route Length (mi.)**	**Average Speed (mph)**	**Route Travel Time (min.)**	**ETE (hr:min)**
Monroe County							
ALCC	70	3	15	7.2	38.7	11	**1:40**
IHM Motherhouse	70	7	15	3.4	5.8	36	**2:05**
Lutheran Home	70	4	15	5.0	4.4	68	**2:35**
Maplewood Manor	70	4	15	7.0	37.5	11	**1:40**
Medilodge II	70	3	15	3.4	5.6	36	**2:05**
Mercy Memorial Hospital	70	35	15	5.4	5.5	59	**2:25**
Tendercare of Monroe	70	6	15	4.1	6.4	38	**2:05**
Wayne County							
Marybrook Residence	70	1	5	4.6	12.1	23	**1:40**
						Maximum for EPZ:	**2:35**
						Average for EPZ:	**2:00**

Enclosure 7

RAI Question 13.03-37

Revised Table of Contents, page vi
(following 1 page(s))

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Attachment 3
NRC3-10-0016

Response to RAI Letter No. 25
(eRAI Tracking No. 4339)

RAI Question No. 13.03-38

NRC RAI 13.03-38

Supplemental RAI 13.03-03 Subject: ETE Methodology

The applicant's response to RAI 13.03-3.D states that no credit is taken for expected improvements that are caused by the implementation of traffic guides. The applicant's response to RAI 13.03-3.A states that adjustments are made to represent the movement of traffic under evacuation conditions. Revise the text of the ETE report to clarify whether or not the current analysis approximates the use of traffic guides, based on the manner in which the analyst adjusts green time at intersections to represent movement of traffic under evacuation conditions, or provide a justification for why this is not needed.

Response

The original response to RAI 13.03-3 was submitted in Detroit Edison letter NRC3-09-0033 (ML092931167), dated October 14, 2009.

The ETE does not approximate the use of traffic guides at traffic control points based on the adjustment of green time at signalized intersections. Detroit Edison's response to RAI 13.03-3.A, acknowledged that signal green time utilized by the evacuation model is dependent on traffic volume at signalized intersections. As stated in Detroit Edison's response to RAI 13.03-3.A, the analyst adjusts the allocation of green time in the simulation model so that it services the competing traffic volumes expected during evacuation conditions. In this manner, the model is executed in an iterative procedure so as to provide assurance that the allocations of "effective green time" at intersections appropriately represent the operating conditions during an evacuation. The actual signal timing may not optimally service the actual traffic environment during an evacuation. Accordingly, the actual signal control may be inefficient in that it allocates an insufficient amount of green time to service the approaches with heavier evacuation flows, thereby contributing to congested conditions. Under these circumstances, evacuees who are restrained on the approach to an intersection by a red signal indication will likely treat the red signal as a flashing red signal (functionally, a stop sign) and cautiously discharge into the intersection when there is an absence of competing cross street traffic. In this case, drivers evacuating from an area will effectively "adjust" the signal split to be more favorable in supporting their need to evacuate the area. The allocation of green time in the simulation model provides a realistic representation of this human behavior, but does not reflect the presence of traffic guides performing traffic control during an evacuation.

As stated in Detroit Edison's response to RAI 13.03-3.A, the goal of this ETE modeling activity is to realistically represent the traffic environment during emergency evacuation conditions. Consistent with this objective, the signal splits input into the model are adjusted to represent realistic human behavior during emergency evacuation based on traffic conditions, but are not treated optimally as though there are expert traffic control personnel controlling the signal at all times. The outcome of this approach to developing ETE estimates is to provide realistic estimates of evacuation time to the appropriate State and local authorities.

As described in Detroit Edison's response to RAI 13.03-3.D, ETE Report Revision 1 Section 2.3 (Assumption 6), Section 9, and Appendix G were revised to provide additional detail on the treatment of Traffic Control Points (TCPs) in this study. These TCPs are not considered in specifying the inputs to the DYNEV model used to calculate the ETE. As suggested by NUREG-0654, Appendix 4, Section V, the ETE study should include "specific recommendations for actions that could be taken to significantly improve evacuation time". Based on this guidance, the ETE includes suggested TCPs and Access Control Points (ACPs) in Appendix G that could be considered by local law enforcement personnel during an evacuation in order to reduce evacuation times. Because the number of TCPs and ACPs that will be staffed is subject to availability of qualified individuals, the degree of implementation of TCPs and ACPs is uncertain and therefore not considered in computing the ETE.

In summary, the adjustment of green times to balance competing traffic volumes at intersections is not done as a means of modeling traffic guides performing traffic control at critical intersections. Rather, it is done to realistically represent the traffic environment during emergency evacuation conditions.

<u>Proposed COLA Revision</u>

The following changes are presented in the "Fermi Nuclear Power Plant Development of Evacuation Time Estimates Report" Revision 2 contained in Attachment 15.

1. Add the following text to the end of item 6 in Section 2.3:

   The goal of the ETE modeling activity is to realistically represent the traffic environment during emergency evacuation conditions. Consistent with this objective of representing realistic driver behavior, it is assumed that all drivers will respond safely to traffic control regardless of whether that control is implemented by a traffic signal, a stop sign or by traffic control personnel at a TCP. The signal splits input to the model are adjusted to represent realistic human behavior during emergency evacuation based on traffic conditions but are not treated optimally as though there is expert traffic control personnel controlling the signal at all times. The outcome of this approach to developing ETE estimates is to produce realistic estimates of evacuation time.

Attachment 4
NRC3-10-0016

Response to RAI Letter No. 25
(eRAI Tracking No. 4339)

RAI Question No. 13.03-39

NRC RAI 13.03-39

Supplemental RAI 13.03-04: Subject: Analysis of Evacuation Times, Methodology – Travel Delay

The applicant's response to RAI 13.03-12.A, explained that average network-wide speeds of 31.9 mph and 36.4 mph were retained for EMS vehicles because these vehicles have the right of- way in an emergency. The response does not address how EMS vehicles would traverse congested roadways to achieve these speeds. Re-calculate the ETE for the EMS vehicles using route-specific speeds. Update the ETE document accordingly, or provide a justification for why this is not needed.

Response

The original response to RAI 13.03-12 was submitted in Detroit Edison letter NRC3-09-0033 (ML092931167), dated October 14, 2009.

Most of the major evacuation routes in the Fermi EPZ have adequate roadway shoulders to allow for emergency vehicles to pass traffic and avoid roadway congestion. Nonetheless, it will conservatively be assumed that ambulances travel at route specific-speeds rather than using network-wide average speeds. The ambulances will use the same routes that were used for buses evacuating ambulatory patients from medical facilities within the EPZ – see Table 8-9 in Rev. 1 of the ETE report.

The route lengths range from 3.4 to 7.0 miles (see Enclosure 1) with an average of 4.8 miles for those facilities with bedridden patients who require ambulance transport to evacuate. Thus, the estimate of 5 miles of travel to the EPZ boundary on page 8-10 of Rev. 1 of the ETE report is valid. The route-specific average speeds range from 25.8 to 41.6 mph (see Enclosure 1). Three of the routes had lower average speeds than the network wide average speed of 31.9 mph which was used for ambulances in Rev. 1 of the ETE report (see page 8-10), while four of the routes had higher average speeds. Route-specific speeds for an evacuation of the entire EPZ (Region R3) under Scenario 6 (winter, midweek, midday with good weather) conditions were used.

As discussed on page 8-10, ambulances arrive at facilities within 30 minutes and an additional 30 minutes are needed to load patients. Therefore, ambulances are ready to leave the facilities 1 hour after the advisory to evacuate (ATE). Based on the data in Table 6-4 in the ETE report, vehicles evacuating residents with commuters account for 38% of the evacuating vehicles under Scenario 6 conditions. According to Table 5-1 of the ETE report, only 10% of households with commuters are ready to begin their evacuation trip within 1 hour after the ATE. Congestion exists within the EPZ at 1 hour after the ATE, but travel speeds are fairly high as many evacuees have not yet begun their evacuation trip because they are awaiting the return of commuters.

The ETE for the individual facilities ranged from 1 hour and 5 minutes to 1 hour and 15 minutes in good weather (average of 1 hour and 10 minutes) when using route-specific speeds (see Enclosure 1), which is in good agreement with the estimate provided on page 8-10 of Rev. 1 of the ETE report.

Proposed COLA Revision

The following changes are presented in the "Fermi Nuclear Power Plant Development of Evacuation Time Estimates Report" Revision 2 contained in Attachment 15.

1. Revised the second paragraph on page 8-10 as follows:

    It is reasonable to assume that ambulances will travel at approximately 50 mph from neighboring cities, given that they are traveling counter to the evacuation flow and that these are emergency vehicles which always have right of way. It is estimated that at most 30 minutes (25 miles at 50 mph) will be needed to mobilize ambulances and travel to the medical facilities. Mobilization time is 5 minutes longer in rain. Loading times are conservatively estimated as 30 minutes. As with the buses transporting ambulatory patients, the average speed along the route output by PC-DYNEV was used to calculate the route travel time; Tables 8-13A and 8-13B provide the ETE for a single wave evacuation for ambulances evacuating bedridden persons from special facilities in good weather and rain, respectively. The routes input to UNITES for these facilities are documented in Table 8-9. All ETE are rounded up to the nearest 5 minutes. ~~ambulances will have to travel 5 miles, on average, to leave the EPZ. The average speed output by the model at 1 hour for Region 3, Scenario 6 is 31.9 mph; thus, travel time out of the EPZ is 10 minutes.~~

    ~~The ETE for ambulances is: 30 + 30 + 10 = 1:10.~~

2. Added Tables 8-13A and 8-13B at the end of Section 8 as shown in Enclosure 1.

3. Added Tables 8-13A and 8-13B to page vi of the Table of Contents as shown in Enclosure 7 to the response to RAI 13.03-37.

4. Added Table 8-13A (as shown in Enclosure 1) to the end of the Executive Summary.

5. Added the following bullet to the end of page ES-4 in the Executive Summary:

    - Table 8-13A provides the ETE for ambulances evacuating bedridden medical facility residents in good weather.

Enclosure 1

RAI Question 13.03-39

Revised: "Table 8-13. Evacuation Time Estimates for Ambulances"
(following 1 page(s))

Table 8-13A. Evacuation Time Estimates for Ambulances - Good Weather

Facility	Mobilization (min.)	Loading Time (min.)	Route Length (mi.)	Average Speed (mph)	Route Travel Time (min.)	ETE (hr:min)
Monroe County						
IHM Motherhouse	30	30	3.4	27.8	7	**01:10**
Lutheran Home	30	30	5.0	27.4	11	**01:15**
Maplewood Manor	30	30	7.0	41.6	10	**01:10**
Medilodge II	30	30	3.4	37.6	5	**01:05**
Mercy Memorial Hospital	30	30	5.4	25.8	13	**01:15**
Mercy Memorial Nursing Center	30	30	5.4	42.1	8	**01:10**
Tendercare of Monroe	30	30	4.1	38.6	6	**01:10**
					Maximum for EPZ:	**01:15**
					Average for EPZ:	**01:10**

Table 8-13B. Evacuation Time Estimates for Ambulances - Rain

Facility	Mobilization (min.)	Loading Time (min.)	Route Length (mi.)	Average Speed (mph)	Route Travel Time (min.)	ETE (hr:min)
Monroe County						
IHM Motherhouse	35	30	3.4	17.7	12	**01:20**
Lutheran Home	35	30	5.0	17.4	17	**01:25**
Maplewood Manor	35	30	7.0	37.5	11	**01:20**
Medilodge II	35	30	3.4	34.0	6	**01:15**
Mercy Memorial Hospital	35	30	5.4	13.3	24	**01:30**
Mercy Memorial Nursing Center	35	30	5.4	38.0	8	**01:15**
Tendercare of Monroe	35	30	4.1	34.9	7	**01:15**
					Maximum for EPZ:	**01:30**
					Average for EPZ:	**01:20**

Attachment 5
NRC3-10-0016

Response to RAI Letter No. 25
(eRAI Tracking No. 4339)

RAI Question No. 13.03-40

NRC RAI 13.03-40

Supplemental RAI 13.03-05: Subject: Analysis of Evacuation Times, Methodology, Transit Dependent

The applicant's response to RAI 13.03-13.A implies that the single wave evacuation identified in Tables 8-7A and 8-7B is applicable only when school is not in session. Revise the ETE report to add additional text or footnotes for Tables 8.7A and 8.7B to better indicate the assumptions regarding single wave ETE values in the tables, or provide a justification for why this is not needed.

Response

The original response to RAI 13.03-13 was submitted in Detroit Edison letter NRC3-09-0033 (ML092931167), dated October 14, 2009.

As discussed in Detroit Edison's response to RAI 13.03-13.A, the single wave ETE values provided in Tables 8-7A and 8-7B are applicable under the following circumstances:

1. School is not in session. Therefore, all buses available in the county can be used for evacuation of the transit dependent general population.
2. School is in session and there are sufficient bus resources available to service school children and the transit dependent general population simultaneously.

Thus, the second wave ETE only applies when school is in session and there are not sufficient bus resources to evacuate school children and the transit dependent general population simultaneously.

Proposed COLA Revision

The following changes are presented in the "Fermi Nuclear Power Plant Development of Evacuation Time Estimates Report" Revision 2 contained in Attachment 15.

1. Replaced Tables 8-7A and 8-7B on pages 8-23 and 8-24 with the revised versions of the tables provided in Enclosure 1.

2. Replaced Table 8-7A on page ES-12 of Rev. 1 with the revised version of the table provided in Enclosure 1.

3. Deleted the final sentence of the first paragraph on page 8-8 of Rev. 1.

4. Revised the final paragraph under the "Activity: Bus Returns to Route for Second Wave Evacuation" heading on page 8-8 of Rev. 1 as follows:

   ~~The~~ ETE ~~estimates~~ for ~~the~~ single wave and second wave evacuations are ~~given~~ provided in Tables 8-7A and B. Single wave ETE are applicable when school is not in session or when school is in session and there are sufficient bus resources available to service school children and the transit dependent general population simultaneously. In the event there are not sufficient buses available to transport the transit dependent until the evacuation of the school children has been completed, the second wave ETE will apply. The ETE for the transit-dependent population approximate, on average, the ETE for the 100th percentile of the general population.

Enclosure 1

RAI Question 13.03-40

Table 8-7A: "Transit-Dependent Evacuation Time Estimates – Good Weather"

Table 8-7B: "Transit-Dependent Evacuation Time Estimates – Rain"
(following 2 page(s))

Table 8-7A. Transit-Dependent Evacuation Time Estimates - Good Weather

		Single Wave[4]						Second Wave[5]								
Route Number	Bus Number	Mobilization (min.)	Route Length (mi.)	Average Speed (mph)	Route Travel Time (min.)	Pickup Time (min.)	ETE (hr:min)	Arrive at RC (min.)	Unload (min.)	Driver Rest (min.)	Head-way (min.)	Return to EPZ (min.)	Average Speed (mph)	Route Travel Time (min.)	Pickup Time (min.)	ETE (hr:min)
1	1	90	12.5	7.3	103	30	03:45	85	5	10	0	16	7.6	99	30	04:05
	8	114	12.5	9.0	83	30	03:50	85	5	10	24	16	11.0	68	30	04:00
2	1	90	8.9	10.3	52	30	02:55	85	5	10	0	16	7.7	69	30	03:35
	8	114	8.9	9.2	58	30	03:25	85	5	10	24	16	8.6	62	30	03:55
3	1	90	9.1	20.2	27	30	02:30	85	5	10	0	16	10.1	54	30	03:20
	8	114	9.1	9.5	57	30	03:25	85	5	10	24	16	8.5	64	30	03:55
4	1	90	9.4	10.8	52	30	02:55	85	5	10	0	16	8.4	67	30	03:35
	8	114	9.4	9.2	61	30	03:25	85	5	10	24	16	7.9	71	30	04:05
5	1	90	7.3	33.7	13	30	02:15	85	5	10	0	16	33.7	13	30	02:40
	3	99	7.3	33.7	13	30	02:25	85	5	10	9	16	33.7	13	30	02:50
6	1	90	10.2	24.5	25	30	02:25	85	5	10	0	16	24.5	25	30	02:55
	4	102	10.2	25.5	24	30	02:40	85	5	10	12	16	27.8	22	30	03:00
7	1	90	5.9	17.7	20	30	02:20	85	5	10	0	16	12.6	28	30	02:55
	3	99	5.9	13.6	26	30	02:35	85	5	10	9	16	14.2	25	30	03:00
						Maximum for EPZ:	03:50								Maximum for EPZ:	04:05
						Average for EPZ:	02:55								Average for EPZ:	03:25

4 Single Wave ETE are applicable when school is not in session or when school is in session and there are sufficient bus resources available to service school children and the transit dependent general population simultaneously.

5 Second Wave ETE are applicable when there are not sufficient buses available to transport the transit dependent until the evacuation of the school children has been completed.

Table 8-7B. Transit-Dependent Evacuation Time Estimates - Rain

		Single Wave[6]						Second Wave[7]								
Route Number	Bus Number	Mobilization (min.)	Route Length (mi.)	Average Speed (mph)	Route Travel Time (min.)	Pickup Time (min.)	ETE (hr:min)	Arrive at RC (min.)	Unload (min.)	Driver Rest (min.)	Head-way (min.)	Return to EPZ (min.)	Average Speed (mph)	Route Travel Time (min.)	Pickup Time (min.)	ETE (hr:min)
1	1	100	12.5	7.0	107	40	04:10	110	5	10	0	18	7.8	96	40	04:40
	8	124	12.5	6.9	108	40	04:35	110	5	10	24	18	8.8	85	40	04:55
2	1	100	8.9	7.5	71	40	03:35	110	5	10	0	18	6.2	86	40	04:30
	8	124	8.9	6.5	82	40	04:10	110	5	10	24	18	7.9	68	40	04:35
3	1	100	9.1	11.1	49	40	03:10	110	5	10	0	18	9.6	57	40	04:00
	8	124	9.1	9.7	56	40	03:40	110	5	10	24	18	10.9	50	40	04:20
4	1	100	9.4	9.4	60	40	03:20	110	5	10	0	18	8.2	69	40	04:15
	8	124	9.4	8.1	70	40	03:55	110	5	10	24	18	8.7	65	40	04:35
5	1	100	7.3	29.2	15	40	02:35	110	5	10	0	18	29.2	15	40	03:20
	3	109	7.3	29.2	15	40	02:45	110	5	10	9	18	29.2	15	40	03:30
6	1	100	10.2	21.1	29	40	02:50	110	5	10	0	18	22.7	27	40	03:30
	4	112	10.2	22.7	27	40	03:00	110	5	10	12	18	29.1	21	40	03:40
7	1	100	5.9	11.4	31	40	02:55	110	5	10	0	18	14.8	24	40	03:30
	3	109	5.9	12.6	28	40	03:00	110	5	10	9	18	15.4	23	40	03:35
						Maximum for EPZ:	04:35								Maximum for EPZ:	04:55
						Average for EPZ:	03:25								Average for EPZ:	04:05

[6] Single Wave ETE are applicable when school is not in session or when school is in session and there are sufficient bus resources available to service school children and the transit dependent general population simultaneously.

[7] Second Wave ETE are applicable when there are not sufficient buses available to transport the transit dependent until the evacuation of the school children has been completed.

Attachment 6
NRC3-10-0016

Response to RAI Letter No. 25
(eRAI Tracking No. 4339)

RAI Question No. 13.03-41

NRC RAI 13.03-41

Supplemental RAI 13.03-06: Subject: Other Requirements, Confirmation of Evacuation

The applicant's response to RAI 13.03-15.A described the confirmation time with respect to guidance within NUREG-0654 and stated that the counties had not committed to implementing the recommended approach. Provide the time the counties estimate it would take to confirm the evacuation is complete. Update the ETE with this information, or provide a justification for why this is not needed.

Response

The original response to RAI 13.03-15 was submitted in Detroit Edison letter NRC3-09-0033 (ML092931167) dated October 14, 2009.

Numerous options are available in an emergency to confirm that all persons in a designated evacuation area that desire to evacuate have done so. These options range from surveying a statistically random sample of 0.8% of the landline phones in the area to a full door-to-door validation. Each method has its unique advantages combined with its shortcomings.

As discussed in Detroit Edison's response to RAI 13.03-15, the county plans indicate that confirmation of evacuation will be accomplished by monitoring traffic flow out of the EPZ, interviewing evacuees at reception centers, or by door-to-door confirmation.

To provide a bounding time estimate a complete door-to-door confirmation is assumed. The following parameters are used in order to estimate the confirmation time:

- According to the telephone survey (Figure F-1), the average household size in the EPZ is 2.72 people. Based on an entire EPZ population of 103,343 (Table 3-2), there are approximately 38,000 households in the EPZ.
- 10 emergency vehicles patrol the EPZ after the estimated time to evacuate 100% of the EPZ population (about 4 hours, on average; See Table 7-1D) to confirm evacuation.
- Emergency vehicles will make announcements using the vehicle's public address system informing residents to call 911 if they are still at home and have not yet evacuated.
- Door to door distance within the EPZ is approximately 150 feet.
- Average speed of an emergency vehicle during patrol is 5 mph.

Based on the number of households in the EPZ and the parameters above, the bounding time to complete door-to-door confirmation is computed as follows:

38,000 households x 150 ft ÷ 5280 ft/mile ÷ 5 mi/hr ÷ 10 vehicles = 21.6 hr

If additional patrol vehicles are available or if only a portion of the EPZ is in the evacuation region, this time would be reduced.

Proposed COLA Revision

The following changes are presented in the "Fermi Nuclear Power Plant Development of Evacuation Time Estimates Report" Revision 2 contained in Attachment 15.

1. Deleted the final sentence of the second paragraph on page 12-1 of Rev. 1.

2. Deleted the third paragraph on page 12-1 of Rev. 1.

3. Added the following text to the beginning of the fourth paragraph on page 12-1 of Rev. 1.

    Based on the amount of time and effort needed to complete door-to-door confirmation, we suggest the following alternative or complementary approach.

4. Added the following text to the beginning of Section 12 after the first sentence:

Numerous options are available in an emergency to confirm that all persons in a designated evacuation area that desire to evacuate have done so. These options range from surveying a statistically random sample of 0.8% of the landline phones in the area to a full door-to-door validation. Each method has its unique advantages combined with its shortcomings.

To provide a bounding time estimate a complete door-to-door confirmation is assumed. The following parameters are used in order to estimate the confirmation time:

- According to the telephone survey (Figure F-1), the average household size in the EPZ is 2.72 people. Based on an entire EPZ population of 103,343 (Table 3-2), there are approximately 38,000 households in the EPZ.
- 10 emergency vehicles patrol the EPZ after the estimated time to evacuate 100% of the EPZ population (about 4 hours, on average; See Table 7-1D) to confirm evacuation.
- Emergency vehicles will make announcements using the vehicle's public address system informing residents to call 911 if they are still at home and have not yet evacuated.
- Door to door distance within the EPZ is approximately 150 feet.
- Average speed of an emergency vehicle during patrol is 5 mph.

Based on the number of households in the EPZ and the parameters above, the bounding time to complete door-to-door confirmation is computed as follows:

38,000 households x 150 ft ÷ 5280 ft/mile ÷ 5 mi/hr ÷ 10 vehicles = 21.6 hr

If additional patrol vehicles are available or if only a portion of the EPZ is in the evacuation region, this time would be reduced.

Attachment 7
NRC3-10-0016

Response to RAI Letter No. 25
(eRAI Tracking No. 4371)

RAI Question No. 17.5-9

NRC RAI 17.5-9

Appendix B to 10 CFR Part 50 states, in part, that every applicant for a combined license under part 52 is required to include in its final safety analysis report a description of the quality assurance applied to the design, and to be applied to the fabrication, construction, and testing of the structures, systems, and components of the facility.

The NRC endorsed Nuclear Energy Institute (NEI) QAPD template (NEI 06-14, Revision 7, "Quality Assurance Program Description") as a method for providing a QAPD that meets the requirements of 10 CFR Part 50, Appendix B.

Attachment 1 to NRC3-09-0027, "Detroit Edison Company Response to NRC RAI Letter No. 10," dated September 30, 2009, states the last bullet item in FSAR Appendix 11AA, Part II, Section 7.2 will be revised to replace the reference for RIS 2002-22 with EPRI Topical Report TR-106439.

NEI 06-14A, Revision 6, replaced the reference to Regulatory Issue Summary 2002-22 with a reference to Electric Power Research Institute (EPRI) Topical Report (TR) 106439. However, the use of EPRI TR-106439 is limited to digital instrumentation and control (I&C). The staff requests that the reference be removed. This change is reflected in NEI 06-14, Revision 7. Additionally, please clarify if the proposed revision is applicable to FSAR Appendix 11AA (as stated) or FSAR Appendix 17AA.

Note: This RAI is supplemental to RAI 17.5-1 included in NRC RAI Letter No. 10, dated August 12, 2009.

Response

The reference to Electric Power Research Institute (EPRI) Topical Report (TR) 106439 is being removed from the Fermi 3 QAPD presented in Appendix 17AA, vice Appendix 11AA as stated in the response to RAI 15.5-1 in Detroit Edison letter NRC3-09-0027 (ML092790561) dated September 30, 2009.

Proposed COLA Revision

Appendix 17AA is being revised as shown in the attached markup.

Markup of Detroit Edison COLA
(following 1 page(s))

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

- The accreditation is based on ANS/ISO/IEC 17025.
- The published scope of accreditation for the calibration laboratory covers the necessary measurement parameters, ranges, and uncertainties.

- For Section 8.1, Fermi 3 considers documents that may be stored in approved electronic media under Fermi 3 or vendor control and not physically located on the plant site but which are accessible from the respective nuclear facility site as meeting the NQA-1 requirement for documents to be available at the site. Following completion of the construction period, sufficient as-built documentation will be turned over to Fermi 3 to support operations. The Fermi 3 records management system will provide for timely retrieval of necessary records.
- In lieu of the requirements of Section 10, Commercial Grade Items, controls for commercial grade items and services are established in Fermi 3 documents using 10 CFR 21 and the guidance of EPRI NP-5652 as discussed in Generic Letter 89-02 and Generic Letter 91-05.
- For commercial grade items, special quality verification requirements are established and described in Fermi 3 documents to provide the necessary assurance an item will perform satisfactorily in service. The Fermi 3 documents address determining the critical characteristics that ensure an item is suitable for its intended use, technical evaluation of the item, receipt requirements, and quality evaluation of the item.
- Fermi 3 will also use other appropriate approved regulatory means and controls to support Fermi 3 commercial grade dedication activities. ~~One example of this is Electric Power Research Institute (EPRI) Topical Report TR-106439, "Guideline on Evaluation and Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Applications," dated July 17, 1997.~~ Fermi 3 will assume 10 CFR 21 reporting responsibility for all items that Fermi 3 dedicates as safety-related.

Attachment 8
NRC3-10-0016

Response to RAI Letter No. 25
(eRAI Tracking No. 4374)

RAI Question No. 17.5-10

NRC RAI 17.5-10

SRP Section 17.5 part II, subsection A, "Organization," states that the applicant's QAPD should 1) contain an organizational description that addresses the organizational structure, functional responsibilities, levels of authority, and interfaces, 2) include the onsite and offsite organizational elements that function under the cognizance of the QA program, 3) define the interface responsibilities for multiple organizations.

The NRC endorsed Nuclear Energy Institute (NEI) QAPD template (NEI 06-14, Revision 7, "Quality Assurance Program Description") as a method for providing a QAPD that meets the requirements of 10 CFR Part 50, Appendix B.

Attachment 6 to NRC3-09-0027, "Detroit Edison Company Response to NRC RAI Letter No. 10," dated September 30, 2009, states FSAR Appendix 17AA, Part II, Section 1, Fermi 3 QAPD "Organization" will be revised to reflect NEI 06-14, Revision 7.

Proposed changes to the Fermi 3 QAPD (FSAR Appendix 17AA) Part II, Section 1, provided as part of Insert 1 of Attachment 5 to NRC3-09-0027, "Detroit Edison Company Response to NRC RAI Letter No.10," dated September 30, 2009, contain varying content and depth of information for the organizational functions, responsibilities, and transition information provided. Staff review identified that the QAPD does not appear to meet the organizational guidance of the SRP section 17.5 or the NEI QAPD template for all described positions, organizations, and transitions. Specifically, the section does not appear to provide enough detailed information to address the eight "notes" beginning with the third paragraph of NEI 06-14, Revision 7, Part II, Section 1, "Organization."

Please provide additional details within Part II, Section 1, of the QAPD to address the "notes" of NEI 06-14, or provide justification for any exceptions to the guidance provided in NEI 06-14, Revision 7.

Note: This RAI is supplemental to RAI 17.5-5 and RAI 17.5-6 included in NRC RAI Letter No. 10, dated August 12, 2009.

Response

Detroit Edison reviewed the notes of NEI 06-14, Rev. 7 and is addressing the changes to the QAPD for each note as addressed below:

1. *The following information will be utility specific but should follow the SRP for the content. This also includes interface responsibilities for multiple organizations performing quality-related functions. This section should be developed to include the organization that is to implement the phase the QAPD is intended to cover, e.g., ESP, COLA, Construction/Pre-operation/Test, and Operations. The description should include levels of authority, interfaces, and functional responsibilities for each position. In addition, for QAPDs that cover activities during both construction and operations, it*

should include enough detail to distinguish the organizational structure for construction and for operations. Include organization charts that describe the QA organization that is/will be in place for all positions responsible for establishing, maintaining, and implementing QA requirements from corporate positions through plant positions.

Appendix 17AA, "Fermi 3 Quality Assurance Program Description," Part II, Section 1.1 describes the Pre-COL organization which implements the Fermi 3 Quality Assurance Program Description (QAPD) during the Pre-COL and COL phase.

Appendix 17AA, Part II, Section 1.2; Appendix 13AA, "Design and Construction Responsibilities" and Appendix 14AA, "Description of Initial Test Program Administration" describes the Design and Construction Organization and has been revised to include necessary operational elements to support and accept turnover of systems, structures and components and maintain these systems, structures or components following turnover.

Appendix 17AA, Part II, Section 1.3 integrates FSAR Subsection 13.1.2.1, "Plant Organization" and FSAR Subsection 13.1.1.2, "Technical Support for Plant Operations" to describe the Fermi 3 Site organization which implements elements of the Fermi 3 QAPD from turnover of system, structures and components, through the post turnover period during the Construction phase and fully implements the Fermi 3 QAPD during the Operating phase. This transition is described in the discussion associated with Note 2 and Note 4 below.

Enhancements to FSAR Chapter 1, Chapter 13, Appendix 13AA, Appendix 17AA, and Appendix 14AA have been made as shown in the markups provided to this RAI (Chapter 1, "Introduction and General Description of the Plant" and Chapter 13, "Conduct of Operations"), RAI 17.5-12 in Attachment 10 (Appendix 17AA, "Fermi 3 Quality Assurance Program Description"), and RAI 17.5-15 in Attachment 13 (Appendix 13AA, "Design and Construction Responsibilities" and Appendix 14AA, "Description of Initial Test Program Administration") to address all positions responsible for establishing, maintaining and implementing the QA requirements from the Chief Executive Officer to the individuals performing the necessary actions to establish, maintain and implement the QAPD.

2. *Generic titles (e.g., Nuclear Development, Quality Assurance Manager) may be used in the QAPD. However, the generic titles established in the Organization Section must be used throughout the document.*

Chapter 13, "Conduct of Operations;" Appendix 13AA, "Design and Construction Responsibilities;" Appendix 14AA, "Description of Initial Test Program Administration" and Appendix 17AA, "Fermi 3 Quality Assurance Program Description" were reviewed for consistency in the use of generic titles. As a result of this review several changes were made:

a. The use of "manager in charge of engineering" through out Chapter 13 was replaced with the Engineering Director, presented in FSAR Subsection 13.1.2.1.1.3.

b. The "Manager in charge of Operations" on Figure 14AA-201 was replaced with the Operations Manager, presented in FSAR Subsection 13.1.2.1.2.1

c. The use of "plant staff" throughout Chapter 13 was replaced with "operating and technical support" to reflect the presentation of the operating organization in FSAR Subsection 13.1.2, "Operating Organization" and FSAR Subsection 13.1.1.2, "Technical Support for Plant Operations."

d. The titles "site construction executive," "primary contractor," "constructor," "construction," etc. were replaced with the newly described Engineering Procurement and Construction (EPC) executive and EPC organization now presented in Appendix 17AA, Part II, Subsection 1.2.5 or Subsection 1.2.5.1

e. For consistency, the use of "reactor vendor" and "GEH" was replaced with the "reactor technology vendor" identified in FSAR Subsection 1.4.1 as "GE-Hitachi Nuclear Energy Americas, LLC."

f. The titles "health physics supervisor" and "health physics technicians" were replaced by "radiation protection supervisor" and "radiation protection technician" to be consistent with FSAR Subsection 13.1.2.1.1.11 and FSAR Subsection 13.1.2.1.1.12.

3. *Provide a clear illustration of the organization's functional responsibilities, to include preparing, reviewing, approving, and verifying designs; qualifying suppliers; preparing, reviewing, approving, and issuing instructions, procedures, and procurement documents; purchasing; verifying supplier activities; identifying and controlling acceptable and nonconforming hardware and software; manufacturing; calibrating and controlling measuring and test equipment; qualifying and controlling special processes; constructing; inspecting; testing; startup; operating; performing maintenance; performing the audit function; and controlling records. Also, refer to the same organizational titles throughout the QAPD.*

Appendix 17AA, "Fermi 3 Quality Assurance Program Description;" Appendix 13AA, "Design and Construction Responsibilities" and Appendix 14AA, "Description of Initial Test Program Administration" were reviewed to ensure that functional responsibilities were clear. As of the result of this review, several changes were made:

a. The organization presented in FSAR Subsection 13.1.1.2.12 was changed to "Supply Chain" and the presentation of the organization's function improved. The supply chain organization provides procurement, material handling, storage and logistics support, and maintains control of procurement logistics support. The supply chain organization also maintains control of procurement records generated and executed in the performance of its duties. The supply chain organization also performs the necessary functions to contract vendors of special services through its functional relationship with the Director, Corporate Services as described in the response to RAI 17.5-13(c) in Attachment 11 and presented in the markups to the QAPD accompanying that response.

b. The maintenance department, presented in FSAR Subsection 13.1.1.2.5, was assigned the responsibility for maintaining the operational measuring and test equipment program required by QAPD Section 12.

c. The description of the responsibilities of the Engineering Director and his supporting managers/supervisors: Design Engineering; Systems Engineering; Projects Engineering; and Programs Engineering was improved in FSAR Subsection 13.1.2.1.1.3, "Engineering Director" to clarify functional responsibilities for implementation of key sections of the QAPD such as design control, software control, etc.

d. Management of the corrective action program and the non-conformance process were assigned to the Director, Nuclear Development in Appendix 17AA, Part II, Subsection 1.1.2.2.1 for the Pre-COL and COL phase and Subsection 1.2.2.2.1 for the Design and Construction phase. The Plant Safety & Licensing Director is identified as responsible for the onsite corrective action and non-conformance process in FSAR Subsection 13.1.2.1.1.2.

e. The Startup Group Manager, presented in FSAR Subsection 14AA.2.2.1, was assigned the responsibility for maintaining the startup group measuring and test equipment program required by QAPD Section 12.

f. An Engineering Procurement and Construction (EPC) Contractor with an EPC Executive was added to Appendix 17AA, Part II, Subsection 1.2.5 and 1.2.5.1. This organizational element provides a single point of contact for Detroit Edison and is accountable to the site executive described in FSAR Subsection 13AA.1.9. The EPC Executive retains and exercises responsibility for the scope and implementation of the EPC contractor's QA program. The EPC Executive shall have sufficient authority to accomplish those parts of the overall QA program for which the EPC contractor is responsible, including responsibility and authority to stop unsatisfactory work and control of further processing, delivery, installation, or use of nonconforming items. The EPC executive shall ensure that the applicable portion of the EPC contractor's or any subcontractor or vendor's QA program is properly documented, approved, and implemented (people are trained and resources are available) before any activity within the scope of the QA program is undertaken. The EPC contractor shall ensure that the size of the EPC contractor's QA organization is commensurate with its duties and responsibilities. The EPC executive may assign responsibility for ensuring effective execution for any portion of the EPC contractor's QA program but shall ensure that authority as may be necessary to perform the function is provided. The EPC contractor's QA program is binding on all participating organizations, including all employees or contractors whose activities may influence quality.

4. *Structure Section 1, "Organization" of the QAPD such that it clearly delineates how the QA program is implemented during all applicable phases such as the period of construction and testing and the operations phase. The transition process from one phase to another must be described. Position descriptions should clearly delineate these roles during each applicable phase such as the construction/preoperation phase, the operations phase, as well as the transition period between the phases.*

   Appendix 17AA, "Fermi 3 Quality Assurance Program Description," Part II, Section 1.1 describes the Pre-COL organization which implements the Fermi 3 Quality Assurance Program Description (QAPD) during the Pre-COL and COL phase.

   Appendix 17AA, Part II, Section 1.2; Appendix 13AA, "Design and Construction Responsibilities" and Appendix 14AA, "Description of Initial Test Program Administration" describe the Design and Construction Organization and have been revised to include necessary operational elements to support and accept turnover of systems, structures and components and maintain these systems, structures or components following turnover.

   As stated in the revised FSAR Subsection 13.1.1.1 and FSAR Subsection 13AA.2.4, the Sr. Vice President, Major Enterprise Projects is responsible for developing and implementing the organizational transition from the construction phase to the operating phase. As part of this transition, the shift in reporting of the site executive, the head of the site organization, from the Sr. Vice President, Major Enterprise Projects to the Chief Nuclear Officer was added to FSAR Subsection 13.1.2.1.1. This shift completes the transition of the operating organization presented in FSAR Subsection 13.1.2.1, "Plant Organization" and FSAR Subsection 13.1.1.2, "Technical Support for Plant Operations."

   Appendix 17AA, Part II, Section 1.3 integrates FSAR Subsection 13.1.2.1, "Plant Organization" and FSAR Subsection 13.1.1.2, "Technical Support for Plant Operations" to describe the Fermi 3 Site organization which implements elements of the Fermi 3 QAPD from turnover of system, structures and components, through the post turnover period during the Construction phase and fully implements the Fermi 3 QAPD during the Operating phase.

5. *The QAPD describes the functions and responsibilities associated with the quality assurance requirements of 10 CFR 50, Appendix B, Criteria I, "Organization" and Criteria II, "Quality Assurance". All positions associated with the establishment, implementation, and verification of quality-related activities should be shown on the organization charts and described in the QAPD. For the operations phase, the level of detail to be included should include roles, responsibilities, and lines of authority for the positions necessary to implement the requirements of Appendix B. For example, this level of detail will identify where the independent review functions report within the organization. Comparable detail should be provided for the construction/preoperational phase.*

   The organization charts presented in Appendix 17AA, "Fermi 3 Quality Assurance Program Description," Figures II.1-1, II.1-2, and II.1-3 and FSAR Figures 13.1-201, 204, 205 and 14AA-201 have been revised to reflect those positions associated with the establishment, implementation, and verification of quality related activities. QAPD Figure II.1-3 (corporate management), FSAR Figure 13.1-204 (operating organization) and FSAR Figure 13.1-205 (technical support organization) detail the responsibilities and lines of authority for the positions necessary to implement the requirements for an operational 10 CFR 50, Appendix B program. The reporting lines for the independent review functions are identified. Comparable detail for the construction organization is provided through the addition of the EPC organization, including the reactor technology vendor with its NRC approved QAPD and the Architect/Engineer with its Detroit Edison approved QAPD, and the Startup Test Group which would function under the plant manager.

6. *Sufficient detail must be included to fully describe how the organization will perform, manage, and/or oversee activities affecting the quality and performance of safety-related SSCs, including: testing, preoperational activities such as ITAAC, receiving, storing, repairing, decommissioning, refueling, and shipping.*

   The addition of Appendix 14AA into the organizational description in Appendix 13AA (see FSAR Figure 13.1-201) and the Design and Construction organization of the QAPD (see QAPD Figure II.1-2) provides the necessary detail to describe how the organization will perform, manage and oversee activities affecting the quality and performance of safety-related SSCs, including testing and preoperational activities such as ITAAC.

   Addition of the EPC organization, including the reactor technology vendor with its NRC approved QAPD and the Architect/Engineer with its Detroit Edison approved QAPD, provides the necessary detail to describe how the construction organization will oversee activities affecting the quality and performance of safety-related SSCs, including: receiving, storing, repairing, and shipping.

   The organization presented in FSAR Subsection 13.1.1.2.12 was changed to "Supply Chain" and the presentation of the organization's function improved. The supply chain organization provides procurement, material handling, storage and logistics support, and maintains control of procurement logistics support. The supply chain organization also maintains control of procurement records generated and executed in the performance of its duties. The supply chain organization also performs the necessary functions to contract vendors of special services through its functional relationship with the Director, Corporate Services as described in the response to RAI 17.5-13(c) in Attachment 11 and presented in the markups to the QAPD accompanying that response.

7. *The applicant/licensee may provide the required organization description by incorporating by reference information from another section of the FSAR but by so doing, the regulatory change process established by 10 CFR 50.54(a) would be applicable to that incorporated section. If incorporation by reference is used, care must be taken to use the appropriate titles from that section in the QAPD in replacing bracketed text.*

The organization charts presented in QAPD Figures II.1-1, II.1-2, and II.1-3 and FSAR Figures 13.1-201, 204, 205 and 14AA-201 have been revised to reflect those positions associated with the establishment, implementation, and verification of quality related activities. QAPD Figure II.1-3 (corporate management), FSAR Figure 13.1-204 (operating organization) and FSAR Figure 13.1-205 (technical support organization) detail the responsibilities and lines of authority for the positions necessary to implement the requirements for an operational 10 CFR 50, Appendix B program. The reporting lines for the independent review functions are identified. Comparable detail for the construction organization is provided through the addition of the EPC organization, including the reactor technology vendor with its NRC approved QAPD and the Architect/Engineer with its Detroit Edison approved QAPD, and the Startup Test Group which would function under the plant manager.

Proposed COLA Revision

The markup to Chapter 1, "Introduction and General Description of the Plant" and "Chapter 13, "Conduct of Operations" are provided with this response. This markup also shows the relevant changes to Chapter 1 and Chapter 13 resulting from the preparation of the response to the other QA related RAIs in this letter.

The markups to Appendix 13AA, "Design and Construction Responsibilities" and Appendix 14AA, "Description of Initial Test Program Administration" are provided with RAI 17.5-15 in Attachment 13. The markups with RAI 17.5-15 in Attachment 13 also shows the changes to Appendix 13AA and Appendix 14AA resulting from the preparation of the response to the other QA related RAIs in this letter.

The markup to Appendix 17AA, "Fermi 3 Quality Assurance Program Description" is provided with RAI 17.5-12 in Attachment 10. The markup with RAI 17.5-12 in Attachment 10 also shows the changes to Appendix 17AA resulting from the preparation of the response to the other QA related RAIs in this letter.

Markup of Detroit Edison COLA
(following 42 page(s))

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

1.3 Comparison Tables

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

Add the following at the end of this section.

EF3 COL 1.3-1-A There are no updates to DCD Table 1.3-1 based on unit specific information.

1.3.1 **COL Information**

1.3-1-A **Update Table 1.3-1**

This COL item is addressed in Section 1.3.

1.4 Identification of Agents and Contractors

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

EF3 SUP 1.4-1

1.4.1 **Detroit Edison Company**

Detroit Edison is the applicant for the COL, and Detroit Edison will be the licensee authorized to construct and operate Fermi 3. Detroit Edison is therefore responsible for making each of the key project decisions, including the ultimate decision on whether to build a new nuclear power plant, and would be the plant operator.

the reactor technology vendor

Detroit Edison has selected GE-Hitachi Nuclear Energy Americas, LLC (GEH) as ~~its primary contractor~~ for the design of the unit. **[START COM 1.4-001]** The primary contractor for site engineering has not been selected at the time of COLA submittal; this information will be supplied in an FSAR update following selection. **[END COM 1.4-001]** Detroit Edison has responsibility for the operation of the unit. The following sections provide information on the experience and qualifications of the aforementioned agents and contractors as well as the division of responsibility between Detroit Edison and its agents and contractors.

1.4.2 **GE-Hitachi Nuclear Energy Americas, LLC (GEH)**

GEH is responsible for developing the complete standard plant for the ESBWR necessary to obtain a DC from the NRC, supporting preparation of the COL application, and activities to support deployment of the

Changes to the organization described herein:

Design and Construction organization described in Appendix 13AA, Appendix 14AA and Appendix, 17AA Part II, Subsection 1.2;

Technical Support organization described in Subsection 13.1.1.2, and Appendix 17AA, Part II, Subsection 1.3; and

Operating organization described in Subsection 13.1.2.1 and Appendix 17AA, Part II, Subsection 1.3

are reviewed under the provisions of 10 CFR 50.54(a) to ensure that any reduction in commitments in the QAPD (as accepted by the NRC) are submitted to and approved by the NRC, prior to implementation.

This section of the ~~referenced~~ DCD is incorporated by reference with the ~~following~~ departures and/or supplements.

DCD Section 13.1.1, Combined License Information, is renumbered in this FSAR as Subsection 13.1.4 for administrative purposes to allow section numbering to be consistent with RG 1.206 and the Standard Review Plan.

Replace the first paragraph with the following.

EF3 COL 13.1-1-A This section describes the organization of Fermi 3. The organizational structure is described in this section and is consistent with the Human System Interface (HSI) design assumptions used in the design of the ESBWR as described in DCD Chapter 18. The organizational structure is consistent with the ESBWR HFE design requirements and complies with the requirements of 10 CFR 50.54(i) through (m).

13.1.1 Management and Technical Support Organization

Detroit Edison has over 35 years of experience in the operation of nuclear generating stations. Detroit Edison currently operates Fermi 2.

Corporate offices provide support for Fermi site including executive level management to provide strategic and financial support for plant initiatives, and coordination of functional efforts.

Section 17.5 provides high-level illustrations of the corporate organization. More detailed charts and position descriptions, including qualification requirements and staffing numbers for corporate support staff, are maintained in corporate offices.

~~Changes to the organization described herein are reviewed under the provisions of 10 CFR 50.54(a) to ensure that any reduction in commitments in the QAPD (as accepted by the NRC) are submitted to, and approved by the NRC, prior to implementation.~~

planning, design, construction and operation

13.1.1.1 Design, Construction, and Operating Responsibilities

The Sr. Vice President - Major Enterprise Projects is responsible for establishing new nuclear generation.

The chief nuclear officer (CNO) has overall responsibility for functions involving planning, design, construction, and operation of Detroit Edison's current and future nuclear units. Line responsibilities for those functions are passed to the executives in charge of nuclear operations, engineering and technical services, planning, development, and oversight, who maintain direct control of nuclear plant activities.

At the appropriate time after construction, the CNO accepts responsibility for Fermi 3 from the Sr. Vice President - Major Enterprise Projects and then maintains direct control of nuclear plant operation through the site executive (see Appenix 17AA, Part II, Section 1.3).

The first priority and responsibility of each member of the nuclear staff throughout the life of the plant is nuclear safety. Decision making for station activities is performed in a conservative manner with expectations of this core value regularly communicated to appropriate personnel by management interface, training, and station directives.

Lines of authority and communication clearly and unambiguously establish that utility management directs the project.

are established to enable the understanding of the various project members, including contractors, that utility management is in charge of and directs the project.

At key project milestones, including beginning of construction, fuel load, and commercial operation, senior management determines if there are sufficient numbers of qualified personnel available to move the project forward.

Key executive and corporate management positions, functions, and responsibilities are discussed in Section 17.5. The construction management organization is shown in Figure 13.1-201.

addressed in Appendix 17AA, Part II, Section 1.2; Appendix 13AA; and Appendix 14AA and is

13.1.1.1.1 Design and Construction Responsibilities

This section is included in Appendix 13AA for future designation as historical information.

13.1.1.2 Technical Support for Plant Operations

This section describes the functional groups that become activated before fuel load. The site executive establishes the organization of managers, functional managers, supervisors, and staff sufficient to perform required functions for support of safe plant operation. These functions include the following:

- Nuclear, mechanical, structural, electrical, thermal-hydraulic, metallurgical and material, and instrumentation and controls engineering
- Plant chemistry

The operating organization is addressed in Appendix 17AA, Part II, Section 1.3; Subsection 13.1.2.1; and Subsection 13.1.1.2 and is shown in Appendix 17AA, Part II, Figure II.1-3; Figure 13.1-204; and Figure 13.1-205.

- Fueling and refueling operations support
- Maintenance support
- Operations support
- Quality assurance
- Training
- Safety review
- Fire protection
- Emergency organization
- Outside contractual assistance

See Subsection 13.1.2.1.1.2 through Subsection 3.1.2.1.1.4 for description of the responsibilities and authorities of management positions for organizations providing technical support.

In the event that station personnel are not qualified to deal with a specific problem, the services of qualified individuals from other functions within the company or outside consultants are engaged. Figures incorporated into Section 17.5 illustrate the management and technical organizations supporting operation of the plant. Table 13.1-201 shows the estimated number of positions required for each function.

13.1.1.2.1 **Engineering**

The engineering department consists of system engineering, design engineering, engineering programs, engineering projects, safety and engineering analysis, and reactor engineering. These groups are responsible for performing the classical design activities as well as providing engineering expertise for programs, such as reactor engineering, inservice inspection (ISI), inservice testing (IST), snubbers, and maintenance rule. Engineering is also responsible for probabilistic safety assessment and other safety issues, plant system reliability analysis, performance and technical support, core management, and periodic reactor testing.

Each of the engineering groups has a functional manager who reports to the director in charge of engineering.

The engineering organization is responsible for:

- Support of plant operations in the engineering areas of mechanical, structural, electrical, thermal-hydraulic, metallurgical, materials, electronic, and instrument and control. Priorities for support activities are established based on input from the plant manager with emphasis on issues affecting safe operation of the plant.

<bullet> Engineering Projects

- Support of procurement, chemical and environmental analysis, and maintenance activities in the plant as requested by the plant manager
- Performance of design engineering of plant modifications
- Maintaining the design basis by updating the record copy of design documents as necessary to reflect the actual as-built configuration of the plant
- Accident and transient analyses
- Human Factors Engineering design process

Engineering

Reactor engineering, led by the functional manager in charge of reactor engineering, provides technical assistance in the areas of core operations, core thermal limits, and core thermal hydraulics.

~~Design~~ work may be contracted to and performed by outside companies in accordance with Section 17.5.

13.1.1.2.2 **Plant Chemistry**

A chemistry program is established to monitor and control the chemistry of various plant systems such that corrosion of components and piping is minimized and radiation from corrosion by-products is kept to levels that allow operations and maintenance with radiation doses as low as is reasonably achievable.

The functional manager in charge of chemistry is responsible for maintaining chemistry programs and for monitoring and maintaining the water chemistry of plant systems. The staff of the chemistry department consists of laboratory technicians, support personnel, and supervisors who report to the functional manager in charge of chemistry.

13.1.1.2.3 **Radiation Protection**

A radiation protection (RP) program is established to protect the health and welfare of the surrounding public and personnel working at the plant. The RP program is described in Chapter 12.

The RP department is staffed by radiation protection technicians, support personnel, and supervisors who report to the radiation protection manager.

Personnel resources of the RP organization are shared between units. A single management organization oversees RP for the units.

Personnel resources of the outage support organization are shared between units. A single management organization oversees outage support work for all site units.

13.1.1.2.4 Fueling and Refueling Operations Support

The function of fueling and refueling is performed by a combination of personnel from various departments including operations, maintenance, radiation protection, engineering, and reactor technology vendor or other contractor staff. Refueling operations are a function of the operations organization.

13.1.1.2.5 Maintenance Support

The maintenance department includes mechanical maintenance, electrical maintenance, and instrumentation and control (I&C) groups. Each group includes supervisors, foremen, and technicians in sufficient numbers to provide for the safe and efficient operation of the plant during all phases of plant life.

The maintenance department establishes and maintains the operational measuring and test equipment (M&TE) program required by Appendix 17AA, Section 12. The maintenance manger reports to the plant manager.

In support of maintenance activities, planners, schedulers, and parts specialists prepare work packages, acquire proper parts, and develop procedures that provide for the successful completion of maintenance tasks. Maintenance tasks are integrated into the station schedule for evaluation of operating or safe shutdown risk elements and to provide for efficient and safe performance. ~~Functional managers in charge of planning and scheduling report to outage and planning management.~~

13.1.1.2.6 Operations Support

The operations support function is provided under the direction of the operations manager, and includes the following programs:

- Operations procedures
- Operations surveillances
- Equipment tagging preparation
- Fuel handling

13.1.1.2.7 Quality Assurance

Insert 1

~~Safety-related activities associated with the operation of the plant are governed by the quality assurance (QA) program described in Chapter 17.~~

13.1.1.2.8 Training

The training department is responsible for providing training programs that are established, maintained, and implemented in accordance with applicable plant administrative directives, regulatory requirements, and

Insert 1

Safety-related activities associated with the operation of the plant are governed by QA direction established in Chapter 17 of the FSAR and the QA Program Description (QAPD) (see Appendix 17AA). The requirements and commitments contained in the QAPD apply to activities associated with the systems, structures and components (SSCs) that are safety-related and are mandatory and must be implemented, enforced and adhered to by individuals and organizations. QA requirements are implemented through the use of approved procedures, policies, directives, instructions or other documents that provide written guidance for the control of quality-related activities and provide for the development of documentation to provide objective evidence of compliance. The QA function includes:

- Maintaining the QAPD
- Coordinating the development of audit schedules
- Auditing, performing surveillances and evaluating suppliers
- Supporting general QA indoctrination training for the operating and technical support personnel
- Quality Control

The QA organization is independent of the plant management line organization.

Quality control (QC) inspection or testing activities to support plant operation, maintenance, and outages are independent of the plant management line organization.

operating and technical support

company operating policies so that station personnel can meet the performance requirements of their jobs in operations, maintenance, technical support, emergency response, and other areas. The training department's responsibilities encompass operator initial license training, requalification training, and ~~plant~~ staff training as well as the plant access training (general employee training) course and radiation worker training. To maintain independence from operating pressures, the manager of training reports to the director responsible for facility safety and licensing. Nuclear plant training programs are described in Section 13.2.

To the extent practicable given the differences between plant designs, personnel resources of the training department are shared between units. A single management organization provides oversight of station training activities.

13.1.1.2.9 **Safety Review**

Review and audit activities are addressed in Chapter 17.

Oversight of station programs, procedures, and activities is performed by the Onsite Safety Review Organization (OSRO) and an Independent Review Body (IRB), which is responsible for review of corrective actions for significant conditions adverse to quality and the audit program. The supervisor in charge of the IRB ultimately reports to the site executive.

In the event of an unplanned reactor trip or significant power reduction, it is the responsibility of the OSRO to determine the circumstances, analyze the cause, and determine that operations can proceed safely before the reactor is returned to power.

Personnel resources of the IRB organization are shared between units. A single management organization oversees the site IRB organization.

13.1.1.2.10 **Fire Protection**

The station is committed to maintaining a fire protection program as described in DCD Section 9.5.1.15. Fire protection for the facility is organized and administered by the functional manager in charge of fire protection. The functional manager in charge of fire protection is responsible for development and implementation of the fire protection program including development of fire protection procedures, site personnel and fire brigade training, and inspections of fire protection systems and functions. Functional descriptions for all responsible positions are included in appropriate procedures. Station personnel are

EPC

responsible for ~~adhering to the~~ fire protection/prevention requirements detailed in Subsection 9.5.1. The ~~site construction~~ executive will have the lead responsibility for overall construction site fire protection during construction. The fire brigade is described in Subsection 13.1.2.1.5.

13.1.1.2.11 **Emergency Organization**

The emergency preparedness organization is a matrixed organization composed of personnel who have the experience, training, knowledge, and ability necessary to implement actions to protect the public in the case of emergencies. Managers and station personnel assigned to positions in the emergency organization are responsible for supporting the emergency preparedness organization and the emergency plan as required. The staff members of the emergency planning organization administer and orchestrate drills and training to maintain qualification of station staff members, and develop procedures to guide and direct the emergency organization during an emergency. The functional manager in charge of emergency preparedness reports to the director responsible for facility safety and licensing. The site emergency plan organization is described in the Emergency Plan.

Supply Chain

Insert 2

13.1.1.2.12 ~~**Outside Contractual Assistance**~~

~~Contract assistance with vendors and outside suppliers is provided by the materials, procurement, and contracts organization~~. The functional manager in charge of materials, procurement, and contracts reports to the site support director.

and has a functional relationship with Director of Corporate Services (see also Appendix 17AA, Part II).

Resources ~~and~~ management of the materials, procurement, and ~~contracts~~ organization are shared between units.

A single management organization oversees the materials, purchasing and contracts groups for all site units.

13.1.1.3 **Organizational Arrangement**

Organizational arrangement for corporate offices and site organizations reporting directly to corporate offices is presented in Section 17.5.

13.1.1.4 **Qualifications of Technical Support Personnel**

Personnel of the technical support organization meet the education and experience qualifications for those described in ANSI/ANS-3.1 (Reference 13.1-201) as endorsed and amended by RG 1.8.

13.1.2 **Operating Organization**

13.1.2.1 **Plant Organization**

Insert 2

The supply chain organization provides procurement, material handling, storage, and logistics support. The supply chain organization maintains control of procurement records generated and executed in the performance of its duties. In addition, the supply chain organization perform the necessary functions to contract vendors of special services to perform tasks for which the utility does not have experience or the equipment required.

The overall site organization is shown in Appendix 17AA Figure II.1-3, the operating organization is shown in Figure 13.1-204, and the technical support organization is shown in Figure 13.1-205.

The plant management, technical support, and plant operating organizations are ~~incorporated into Section 17.5~~. Additional personnel are required to augment normal staff during outages.

Nuclear plant employees are responsible for reporting problems with plant equipment and facilities. They are required to identify and document equipment problems in accordance with the QA program. QA program requirements as they apply to the operating organization are described in Section 17.5.

(see Section 13.5 for description of the plant procedure program)

Rules of practice are met through administrative controls as described in Section 17.5. These controls include:

- Establishment of a quality assurance program for the operational phase
- Preparation of procedures necessary to carry out an effective quality assurance program
- A program for review and audit of activities affecting plant ~~safety~~
- Programs and procedures for ~~rules of~~ practice

(see Section 17.5 for description of plant review and audit programs)

~~Managers and~~ supervisors within the plant operating organization are responsible for establishing goals and expectations for their organization and to reinforce behaviors that promote radiation protection. Specifically, managers and supervisors are responsible for the following, as applicable to their position within the plant organization:

- Interfacing directly with radiation protection staff to integrate radiation protection measures into plant procedures and design documents into the planning, scheduling, conduct, and assessment of operations and work
- Notifying radiation protection personnel promptly when radiation protection problems occur or are identified, taking corrective actions, and resolving deficiencies associated with operations, procedures, systems, equipment, and work practices
- Training site personnel on radiation protection and providing periodic retraining in accordance with 10 CFR 19 so that personnel are properly instructed and briefed for entry into restricted areas
- Periodically observing and correcting, as necessary, radiation worker practices
- Supporting radiation protection management in implementing the radiation protection program

- Maintaining exposures to site personnel As Low As Reasonably Achievable (ALARA)

delete extra line

Sr. Vice President, Major Enterprise Projects (see Appendix 17AA, Part II, Subsection 1.2.2.1) until construction completion. Following construction completion, the site executive reports to the

(see Appendix 17AA, Part II, Subsection 1.3.2.1)

13.1.2.1.1 **Site Executive**

The site executive reports to the chief nuclear officer. The site executive is directly responsible for management and direction of activities associated with the efficient, safe, and reliable operation of the nuclear station. The site executive is assisted in management and technical support activities by the plant manager, the plant safety and licensing (S&L) director, the site support director and the engineering director. Executive management establishes expectations such that a high level of quality, safety, and efficiency is achieved in aspects of plant operations and support activities through an effective management control system and an organization selected and trained to meet the above objectives.

Additionally, the site executive has overall responsibility for occupational and public radiation safety. Radiation protection responsibilities of the site executive are consistent with the guidance in RG 8.8 and RG 8.10, including the following:

- Providing management radiation protection policy throughout the plant organization
- Providing an overall commitment to radiation protection by the plant organization
- Interacting with and supporting the radiation protection manager on implementation of the radiation protection program
- Supporting identification and implementation of cost-effective modifications to plant equipment, facilities, procedures and processes to improve radiation protection controls and reduce exposures
- Establishing plant goals and objectives for radiation protection
- Maintaining exposures to site personnel ALARA
- Supporting timely identification, analysis, and resolution of radiation protection problems (e.g., through the plant corrective action program)
- Providing training to site personnel on radiation protection in accordance with 10 CFR 19
- Establishing an ALARA Committee with delegated authority from the site that includes the managers in charge of operations, maintenance,

engineering, and radiation protection to help provide for effective implementation of line organization responsibilities for maintaining worker doses ALARA

The succession of responsibility for overall plant instructions or special orders in the event of absences, incapacitation of personnel, or other emergencies is as follows, unless otherwise designated in writing:

- The site executive
- The plant manager
- The operations manager

The succession of authority includes the authority to issue standing or special orders as required.

13.1.2.1.1.1 Plant Manager

The plant manager reports to the site executive, is responsible for safe operation of the plant, and has control over onsite activities necessary for safe operation and maintenance of the plant including the following:

- Operations
- Maintenance and modification
- Outage management

13.1.2.1.1.2 Plant Safety & Licensing (S&L) Director

The plant S&L director reports to the site executive, is responsible for safe operation of the plant, and has control over onsite activities necessary for safe operation and maintenance of the plant including the following:

- Training
- Licensing and emergency preparedness

<bullet> Corrective action program and non-conformance process

13.1.2.1.1.3 Engineering Director

The engineering director reports to the site executive, is responsible for safe operation of the plant, and has control over onsite activities necessary for safe operation and maintenance of the plant including the following:

- Design engineering
- Systems engineering
- Program engineering

Insert 3 (2 pgs)

- Reactor engineering
- Procurement engineering

13.1.2.1.1.4 **Site Support Director**

The site support director reports to the site executive, is responsible for safe operation of the plant, and has control over onsite activities necessary for safe operation and maintenance of the plant including the following:

- Fire protection
- Physical security
- Procedures and document control
- Information systems interface
- Supply chain interface

13.1.2.1.1.5 **Maintenance Manager**

Maintenance of the plant is performed by the maintenance department mechanical, electrical, and instrumentation and control disciplines. The functions of this department are to perform preventive and corrective maintenance, equipment testing, and implement modifications as necessary.

The Maintenance Manager is responsible for the development of maintenance programs. The manager in charge of plant maintenance is responsible for the performance of preventive and corrective maintenance and modification activities required to support operations, including compliance with applicable standards, codes, specifications, and procedures. The maintenance manager reports to the plant manager and provides direction and guidance to the maintenance discipline functional managers and maintenance support staff.

13.1.2.1.1.6 **Maintenance Discipline Functional Managers**

The functional managers of each maintenance discipline (mechanical, electrical, instrumentation and control, and support) are responsible for maintenance activities within their discipline including plant modifications. They provide guidance in maintenance planning and craft supervision. They establish the necessary manpower levels and equipment requirements to perform both routine and emergency type maintenance activities, seeking the services of others in performing work beyond the capabilities of the plant maintenance group. Each discipline functional

Insert 3 (1 of 2 pgs)

13.1.2.1.1.3.1 Design Engineering Manager

The Design Engineering Manager reports to the Engineering Director, serves as key design lead for the nuclear plant and functions as the primary interface with Major Enterprise Projects (see Appendix 17AA, Part II) during construction and startup testing. The Design Engineering Manager facilitates design change package development and implementation. The Design Engineering Manager also has the following responsibilities:

- Provide technical oversight and approval of design products generated by the Design Engineering department
- Ensure changes to plant design are technically adequate
- Maintain administrative control of design calculations
- Establish administrative control for technical software
- Interface with the EPC contractor, reactor technology vendor, A/E and other engineering firms providing design or design input
- Interface with Fire Protection and Environmental Qualification groups and provide necessary design support
- Ensure training and qualification of design department personnel

13.1.2.1.1.3.2 Systems Engineering Supervisor

The System Engineering Manager reports to the Engineering Director, provides oversight of the systems engineers. The System Engineering Supervisor also has the following responsibilities:

- Provide technical direction to other departments regarding the safe, efficient and reliable operation of systems
- Complete assigned technical surveillance testing in accordance with frequencies in the Technical Specifications
- Ensure proper design configuration control of systems, structures and components (SSCs)
- Ensure training and qualification of system engineers.

Insert 3 (2 of 2 pgs)

13.1.2.1.1.3.3 Programs Engineering Manager

The Programs Engineering Manager reports to the Engineering Director and provides oversight of engineering programs (e.g. Environmental Qualification, In-Service Inspection, etc.).

13.1.2.1.1.3.4 Projects Engineering Manager

The Projects Engineering Manager is responsible for the project management of large plant modifications and engineering support functions associated with modifications to plant structures, systems, and equipment. This responsibility includes the planning and management of the engineering scope and specification, detailed design, procurement, installation and testing phases of the project. In this capacity, the Projects Engineering Manager has the responsibility and authority to utilize engineering personnel or retain qualified contract architects/engineers or consultants to implement the design development.

operating and technical support

manager is responsible for liaison with other ~~plant~~ staff organizations to facilitate safe operation of the station. These functional managers report to the maintenance manager.

13.1.2.1.1.7 **Maintenance Discipline Supervisors**

The maintenance discipline supervisors and assistant supervisors (mechanical, electrical, and instrumentation and control) supervise maintenance activities, assist in the planning of future maintenance efforts, and guide the efforts of the craft within their discipline. The maintenance discipline supervisors report to the appropriate maintenance discipline functional managers.

13.1.2.1.1.8 **Maintenance Mechanics, Electricians, and Instrumentation and Control Technicians**

The discipline craft perform electrical and mechanical maintenance and I&C tasks as assigned by the discipline supervisors. They troubleshoot, inspect, repair, maintain, and modify plant equipment and perform Technical Specification surveillances on equipment for which they have cognizance. They perform these tasks in accordance with approved procedures and work packages.

13.1.2.1.1.9 **Outage and Planning Manager**

The outage and planning manager is responsible for the support functions described in Subsection 13.1.1.2.5. This manager safely fulfills the responsibilities of planning and scheduling all plant work through a staff which includes a functional manager in each area of planning, scheduling, and outages. The outage and planning manager reports to the plant manager.

13.1.2.1.1.10 **Radiation Protection Manager**

The radiation protection manager has the direct responsibility for providing adequate protection of the health and safety of personnel working at the plant and members of the public during activities covered within the scope and extent of the license. This manager's radiation protection responsibilities are consistent with the guidance in RG 8.8 and RG 8.10. They include:

- Managing the radiation protection organization
- Establishing, implementing, and enforcing the radiation protection program

- Providing radiation protection input to facility design and work planning
- Tracking and analyzing trends in radiation work performance and taking necessary actions to correct adverse trends
- Supporting the plant emergency preparedness program and assigning emergency duties and responsibilities within the radiation protection organization
- Delegating authority to appropriate radiation protection staff to stop work or order an area evacuated (in accordance with approved procedures) when, in his or her judgment, the radiation conditions warrant such an action and such actions are consistent with plant safety
- Managing the radioactive waste programs
- Managing programs that address radioactive liquid and gaseous effluent releases and associated offsite doses

The radiation protection manager reports to the plant manager and is assisted by the supervisors in charge of radiation protection.

13.1.2.1.1.11 **Radiation Protection Supervisors**

The supervisors in charge of radiation protection are responsible for carrying out the day-to-day operations and programs of the radiation protection department as listed in Subsection 13.1.1.2.3, to promote safe, legal, and efficient plant operation.

Radiation protection supervisors report to the radiation protection manager.

13.1.2.1.1.12 **Radiation Protection Technicians**

Radiation protection technicians (RPTs) directly carry out responsibilities defined in the radiation protection program and procedures. In accordance with Technical Specifications, an RPT is on site whenever there is fuel in the vessel.

The following are some of the duties and responsibilities of the RPTs:

- In accordance with authority delegated by the manager in charge of radiation protection, stop work or order an area evacuated (in accordance with approved procedures) when, in his or her judgment, the radiation conditions warrant such an action and such actions are consistent with plant safety

- Provide coverage and monitor radiation conditions for jobs potentially involving significant radiation exposure
- Conduct surveys, assess radiation conditions, and establish radiation protection requirements for access to and work within restricted, radiation, high radiation, very high radiation, airborne radioactivity areas, and areas containing radioactive materials
- Provide control over the receipt, storage, movement, use, and shipment of licensed radioactive materials, including radioactive wastes destined for offsite processing storage, and disposal
- Review work packages, proposed design modifications, and operations and maintenance procedures to facilitate integration of adequate radiation protection controls and dose-reduction measures
- Review and oversee implementation of plans for the use of process or other engineering controls to limit the concentrations of radioactive materials in the air
- Provide personnel monitoring and bioassay services
- Maintain, prescribe, and oversee the use of respiratory protection equipment
- Perform assigned emergency response duties.
- Manage radioactive liquid and gaseous effluent releases and conduct radiological environmental monitoring in assessing offsite doses to members of the public

13.1.2.1.1.13 **Functional Manager in Charge of Chemistry**

The functional manager in charge of chemistry is responsible for development, implementation, and direction and coordination of the chemistry, radiochemistry, and non-radiological environmental monitoring programs. This area includes overall operation of the hot lab, cold lab, emergency offsite facility lab, and non-radiological environmental monitoring. The functional manager in charge of chemistry is responsible for the development, administration, and implementation of procedures and programs which provide for effective compliance with environmental regulations. The functional manager in charge of chemistry reports to the plant manager via the radiation protection manager and directly supervises the chemistry supervisors.

The functional manager in charge of chemistry is responsible for assuring that a chemistry technician is on site whenever the unit is in modes other than cold shutdown or refueling.

13.1.2.1.1.14 Functional Manager in Charge of Fire Protection

The functional manager in charge of fire protection is responsible for the following:

- Fire protection program requirements, including consideration of potential hazards associated with postulated fires, knowledge of building layout, and system design
- Post-fire shutdown capability
- Design, maintenance, surveillance, and quality assurance of fire protection features (e.g., detection systems, suppression systems, barriers, dampers, doors, penetration seals, and fire brigade equipment
- Fire prevention activities (administrative controls and training)
- Fire brigade organization and training
- Pre-fire planning, including review and updating of pre-fire plans at least every two years

functional manager in charge of fire protection

The functional manager in charge of fire protection reports to the director responsible for site support. Additionally, the functional manager in charge of fire protection works with the operations and engineering departments to coordinate activities and program requirements with the those organizations. In accordance with RG 1.189, the functional manager in charge of fire protection is an individual who has been delegated authority commensurate with the responsibilities of the position and who has available staff personnel knowledgeable in both fire protection and nuclear safety. The ~~Functional Manager in Charge of Fire Protection~~, will meet the requirements of the Fire Protection Engineer as described in DCD Section 9.5.1.15.4.3.

13.1.2.1.2 Operations Department

All operations activities are conducted with safety of personnel, the public, and equipment as the overriding priority. The operations department is responsible for:

- Operation of station equipment

- Monitoring and surveillance of safety- and non-safety-related equipment
- Fuel loading
- Providing the nucleus of emergency and fire-fighting teams

The operations department maintains sufficient licensed and senior licensed operators to staff the control room continuously using a crew rotation system. The operations department is under the authority of the manager in charge of operations who, through the supervisor in charge of shift operations, directs the day-to-day operation of the plant.

Specific duties, functions, and responsibilities of key shift members are discussed in Subsection 13.1.2.1.2.4 through Subsection 13.1.2.1.2.8 and in plant administrative procedures and the Technical Specifications. The minimum shift manning requirements are shown in Table 13.1-202.

For activities that do not require an operator's license, resources of the operations organization may be shared between units. These activities may include administrative functions and tagging. To operate or supervise the operation of more than one unit, an operator (SRO or RO) must hold an appropriate, current license for each unit. See Table 13.1-201 for expected staffing of the operations department, and Table 13.1-202 for minimum shift staffing.

The Operations Support Section is staffed with sufficient personnel to provide support activities for the operating shifts and overall operations department. The following is an overview of the operations organization.

13.1.2.1.2.1 **Operations Manager**

The operations manager has overall responsibility for the day-to-day operation of the plant. The operations manager reports to the plant manager and is assisted by the supervisors of shift operations, operations support, and operations maintenance advisor. Either the operations manager or the supervisor of shift operations is SRO licensed.

13.1.2.1.2.2 **Supervisor of Shift Operations**

The supervisor of shift operations, under the direction of the operations manager, is responsible for:

- Shift plant operations in accordance with the operating license, Technical Specifications, and written procedures operating and technical support groups

- Providing ~~supervision~~ of operating shift personnel for operational shift activities including those of emergency ~~and fire fighting~~ teams
- Coordinating with the supervisor of operations support and other ~~plant staff sections~~
- Verifying that nuclear plant operating records and logs are properly prepared, reviewed, evaluated and turned over to the assistant manager in charge of operations support

The supervisor of shift operations is assisted in these areas by the on-shift operations manager who directs the operating shift personnel. The supervisor of shift operations may assume the duties of the operations manager in the event of an absence.

13.1.2.1.2.3 **Supervisor of Operations Support**

The supervisor of operations support, under the direction of the operations manager is responsible for:

- Directing and guiding plant operations support activities in accordance with the operating license, Technical Specifications, and written procedures
- Providing supervision of operating support personnel and operations support activities, and coordination of support activities
- Providing for nuclear plant operating records and logs to be turned over to the nuclear records group for maintenance as quality records

The supervisor of operations support is assisted by the supervisors of work management, radwaste operations, operations procedures group, and other support personnel. In the absence of the operations manager, the supervisor of operations support may assume the duties and responsibilities of this position.

13.1.2.1.2.4 **Operations Shift Manager**

The operations shift manager is a licensed senior reactor operator (SRO) responsible for the control room command function, and is the plant manager's direct management representative for the conduct of operations. The operations shift manager has the responsibility and authority to direct the activities and personnel onsite as required to:

- Protect the health and safety of the public, the environment, and personnel on the plant site
- Prevent damage to site equipment and structures

- Comply with the operating license

The operations shift manager retains this responsibility and authority until formally relieved of operating responsibilities by a licensed SRO. Additional responsibilities of the operations shift manager include:

- Directing nuclear plant employees to report to the plant for response to potential and real emergencies
- Seeking the advice and guidance of the shift technical advisor and others in executing his duties whenever in doubt as to the proper course of action
- Promptly informing responsible supervisors of significant actions affecting their responsibilities
- Participating in operator training, retraining, and requalification activities from the standpoint of providing guidance, direction, and instruction to shift personnel

The operations shift manager is assisted in carrying out the above duties by the on-shift unit supervisors and the operating shift personnel. The shift operations manager reports to the supervisor of shift operations.

13.1.2.1.2.5 **On-Shift Unit Supervisor**

The on-shift unit supervisor is a licensed SRO. The main functions of the on-shift unit supervisor are to administratively support the operations shift manager such that the "command function" is not overburdened with administrative duties and to supervise the licensed and non-licensed operators in carrying out the activities directed by the operations shift manager. Other duties and responsibilities include:

- Being aware of maintenance and testing performed during the shift
- Directing reactor shutdown if conditions warrant this action
- Informing the operations shift manager and other station management in a timely manner of conditions which may affect public safety, plant personnel safety, plant capacity or reliability, or cause a hazard to equipment
- Initiating immediate corrective action as directed by the operations shift manager in any upset situation until assistance, if required, arrives

- Participating in operator training, retraining, and requalification activities from the standpoint of providing guidance, direction, and instruction to shift personnel
- Responding conservatively to instrument indications unless they are proved to be incorrect
- Adhering to the plant's technical specifications
- Reviewing routine operating data to assure safe operation

The on-shift unit supervisor reports directly to the operations shift manager.

13.1.2.1.2.6 **Reactor Operator**

Reactor operators (RO) are licensed personnel and normally report to the on-shift unit supervisor. They are responsible for routine plant operations and performance of major evolutions at the direction of the on-shift unit supervisor. The RO duties and responsibilities include:

- Monitoring control room instrumentation
- Responding to plant or equipment abnormalities in accordance with approved plant procedures
- Directing the activities of non-licensed operators
- Documenting operational activities, plant events, and plant data in shift logs
- Responding conservatively to instrument indications unless they are proved to be incorrect
- Adhering to the plant's technical specifications
- Reviewing routine operating data to assure safe operation
- Initiating plant shutdowns or scrams or other compensatory actions when:
  - Observation of plant conditions indicates a nuclear safety hazard exists
  - Approved procedures so direct
  - The operator determines that the safety of the reactor is in jeopardy
  - Operating parameters exceed any of the reactor protection system setpoints and automatic shutdown does not occur

Whenever there is fuel in the reactor vessel, at least one reactor operator is in the control room monitoring the status of the unit at the main control panel. The RO assigned to the main control panel is designated the Operator-At-The Controls (OATC) and conducts monitoring and operating activities in accordance with the guidance set forth in RG 1.114, which is further described in Subsection 13.1.2.1.3.

13.1.2.1.2.7 **Non-Licensed Operator**

The non-licensed operators perform routine duties outside the control room as necessary for continuous, safe plant operation including:

- Assisting in plant startup, shutdown, surveillance, and emergency response by manually or remotely changing equipment operating conditions, placing equipment in service, or securing equipment from service at the direction of the RO
- Performing assigned tasks in procedures and checklists such as valve manipulations for plant startup or data sheets on routine equipment checks, and making accurate entries according to the applicable procedure, data sheet, or checklist
- Assisting in training of new employees and improving and upgrading their own performance by participating in the applicable sections of the training program

13.1.2.1.2.8 **Shift Technical Advisor**

The station is committed to meeting NUREG-0737 TMI Action Plan item I.A.1.1 for shift technical advisors (STAs). The STA reports directly to the shift manager and provides advanced technical assistance to the operating shift complement during normal and abnormal operating conditions. The STA's responsibilities are detailed in plant administrative procedures as required by TMI Action Plan I.A.1.1 and NUREG-0737, Appendix C. These responsibilities include:

- Monitoring core power distribution and critical parameters
- Assisting the operating shift with technical expertise during normal and emergency conditions
- Evaluating technical specifications, special reports, and procedural issues

The STA contributes to operations safety by independently observing plant status and advising shift supervision of conditions that could compromise plant safety. During transients or accident situations, the STA independently assesses plant conditions and provides technical assistance and advice to mitigate the incident and minimize the effect on personnel, the environment, and plant equipment.

An SRO on shift who meets the qualifications for the combined SRO/STA position specified for Option 1 of Generic Letter 86-04 (Reference 13.1-202) may also serve as the STA. If this option is used for a shift, the separate STA position may be eliminated for that shift.

13.1.2.1.2.9 **Nuclear Operations Maintenance Advisor**

The nuclear operations maintenance advisor is a licensed SRO. The primary function of this position is to directly supervise activities by non-licensed personnel outside the control room that could affect safe operation of the plant. These activities include, but are not limited to:

- Valve lineups
- Equipment tagging
- Surveillances or other testing activities
- Building rounds
- Maintenance activities

The nuclear operations maintenance advisor reports directly to the manager of nuclear operations.

13.1.2.1.2.10 **Nuclear Operations Support Supervisor**

The nuclear operations support supervisor is a licensed SRO. The primary function of the nuclear operations support supervisor is to review and authorize maintenance, surveillance, or other work or testing activities being performed in the plant. The responsibilities of the nuclear operations support supervisor include keeping the operations shift manager and other operations personnel informed of activities for which they need to be cognizant, verifying that work and testing is safe and appropriate for the existing conditions of the plant, and tracking the work and testing to provide assurance that any LCOs or other requirements will not be exceeded. The nuclear operations support supervisor reports directly to the manager of nuclear operations.

13.1.2.1.3 **Conduct of Operations**

Station operations are controlled and coordinated through the control room. Maintenance activities, surveillances, and removal from/return to service of SSCs affecting the operation of the plant may not commence without the authority of senior control room personnel. The rules of practice for control room activities, as described by administrative procedures, which are based on RG 1.114, address the following:

- Position/placement of the workstation for the operator at the controls and the expected area of the control room where the supervisor/manager in charge on shift should spend the majority of on-shift time
- Definition and outline of "surveillance area" and requirement for continuous surveillance by the operator at the controls
- Relief requirements for operator at the controls and the supervisor/manager in charge on shift

In accordance with 10 CFR 50.54 (i), (j), (k), (l), and (m):

- Reactivity controls may be manipulated only by licensed operators and senior operators except as allowed for training under 10 CFR 55
- Apparatus and mechanisms other than controls which may affect reactivity or power level of the reactor shall be operated only with the consent of the operator at the controls or the manager/supervisor in charge on-shift
- An operator or senior operator shall be present at the controls at all times during the operation of the facility
- For each shift, operations management designates one or more SROs to be responsible for directing the licensed activities of licensed operators
- An SRO shall be present at the facility or readily available on call at all times during its operation, and shall be present at the facility during initial start-up and approach to power, recovery from an unplanned or unscheduled shut-down or significant reduction in power, and refueling, or as otherwise prescribed in the facility license
- Minimum shift staffing for operations personnel is shown in Table 13.1-201
- With the unit in modes other than cold shutdown or refueling, there shall be one SRO in the control room at all times. In addition, there shall be one RO or one SRO at the controls whenever there is fuel in the reactor vessel

13.1.2.1.4 Operating Shift Crews

operating and technical support

Plant administrative procedures implement the required shift staffing. These provisions establish crews with sufficient qualified plant personnel to staff the operational shifts and be readily available in the event of an abnormal or emergency situation. The objective is to operate the plant with the required staff and to develop work schedules that minimize overtime for ~~plant~~ staff ~~members~~ who perform safety-related functions. Work hour limitations and shift manning requirements defined by TMI Action Plan I.A.1.3 are addressed in station procedures. Shift crew staffing plans may be modified during refueling outages to accommodate safe and efficient completion of outage work in accordance with work hour limitations established in administrative procedures.

The minimum composition of an operating shift depends on the operational mode, as shown in Table 13.1-202. Reporting relationships for these positions are shown in Figure 13.1-203 Shift Operations.

EF3 COL 9.5.1-10-A

13.1.2.1.5 Fire Brigade

The plant is designed, and the fire brigade organized, to be self-sufficient with respect to fire fighting activities. The fire brigade is organized to deal with fires and related emergencies that could occur. It consists of a fire brigade leader and a sufficient number of team members to be consistent with the equipment that must be put in service during a fire emergency. A sufficient number of trained and physically qualified fire brigade members are available on site during each shift. The fire brigade consists of at least five members on each shift. Members of the fire brigade are knowledgeable of building layout and system design. The assigned fire brigade members for any shift do not include the operations shift manager nor any other members of the minimum shift operating crew necessary for safe shutdown of the unit, nor do they include any other personnel required for other essential functions during a fire emergency. Fire brigade members for a shift are designated in accordance with established procedures at the beginning of the shift. The fire brigade for Fermi 3 does not include personnel assigned to Fermi 2.

The brigade leader and at least two brigade members have sufficient training in, or knowledge of, plant systems to understand the effects of fire and fire suppressants on safe-shutdown capability. The brigade leader has training or experience necessary to assess the potential safety consequences of a fire and advise control room personnel, as evidenced by possession of an operator's license or equivalent knowledge of plant systems. The qualification of fire brigade members includes an annual physical examination to determine their ability to perform strenuous firefighting activities.

13.1.3 Qualification Requirements of Nuclear Plant Personnel

13.1.3.1 Minimum Qualification Requirements

EF3 COL 13.1-1-A

Qualifications of managers, supervisors, operators, and technicians of the operating organization meet the requirements for education and experience described in ANSI/ANS-3.1 (Reference 13.1-201), as endorsed and amended by RG 1.8. For operators and SROs, these requirements are modified in Section 13.2.

13.1.3.2 Qualification Documentation

Resumes and other documentation of qualification and experience of initial appointees to appropriate management and supervisory positions are available for review by regulators upon request after position vacancies are filled.

13.1.4 COL Information

13.1-1-A Organizational Structure

EF3 COL 13.1-1-A

This COL item is addressed in Subsection 9.5.1.15.3, Subsection 13.1.1 through Subsection 13.1.3, and Appendix 13AA

References

13.1-201 American Nuclear Society, "American National Standard for Selection, Qualification, and Training of Personnel for Nuclear Power Plant," ANSI/ANS -3.1.

13.1-202 U.S. Nuclear Regulatory Commission, "Generic Letter 86-04, Policy Letter, Engineering Expertise on Shift."

Table 13.1-201 Generic Position/Site Specific Position Cross Reference (Sheet 1 of 6) [EF3 COL 13.1-1-A]

Nuclear Function	Function Position (ANS-3.1-1993 section)	Nuclear Plant Position (Site-Specific)	Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
			Estimated Numbers of Full Time Equivalents*			
Executive management	chief nuclear officer & senior executive, nuclear operations (n/a)	Chief Nuclear Officer	1**	1**	1**	1**
	senior executive (n/a)	Site Executive	1**	1**	1**	1**
Nuclear support	executive, construction (n/a)	Sr. Vice President, Major Enterprise Projects ~~Executive~~	1**	1**	1**	
Plant management	plant manager (4.2.1)	Plant Manager			1	1
Operations	manager (4.2.2)	Manager, Operations			1	1
operations, plant	functional manager (4.3.8)	Operations – Shift Supervisor			1	1
operations, admin	functional manager (4.3.8)	Operations – Support Supervisor			1	1
operations, (on-shift)	functional manager (4.4.1)	Shift Manager			6	6
	supervisor (4.4.2)	Unit Supervisor			5	5
	supervisor (4.4.2)	Supervisor, Work Control			5	5
	supervisor (4.6.2)	STA****			5	5
	licensed operator (4.5.1)	Control Room Operator			15	24
	non-licensed operator (4.5.2)	Non-licensed Operator		6	24	30
	rad waste operator (4.5.2)	Rad Waste Operator			1	2
Engineering	manager (4.2.4)	Director, ~~Nuclear~~ Engineering	1	1	1	1
projects	functional manager (4.3.9)	Manager, Projects Engineering		1	1	1
system engineering	functional manager (4.3.9)	Supervisor, System Engineering		1	4	4

Table 13.1-201 Generic Position/Site Specific Position Cross Reference (Sheet 2 of 6)

[EF3 COL 13.1-1-A]

Manager

Nuclear Function	Function Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents*: Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
	system engineer	(4.6.1)	System Engineer	1	4	16	16
design engineering	functional manager	(4.3.9)	~~Supervisor~~, Design Engineering	1	1	1	1
	design engineer	(4.6 – staff engineer)	Design Engineer	3	5	10	15
~~safety and engineering analysis~~	~~functional manager~~	~~(4.3.9)~~	~~Manager, Nuclear Safety Engineering~~		~~1~~	~~1~~	~~1~~
	~~analysis engineer~~	~~(4.6 staff engineer)~~	~~Analysis Engineer~~		~~1~~	~~1~~	~~1~~
engineering programs	functional manager	(4.3.9)	Manager, Engineering Programs		1	1	1
	programs engineer	(4.6–staff engineer)	Programs Engineer		6	12	12
reactor engineering	functional manager	(4.3.9)	Supervisor, Reactor Engineering			1	1
	reactor engineer	(4.6–staff engineer)	Reactor Engineer		1	3	3
Chemistry	functional manager	(4.3.2)	Manager, ~~Radiation Protection~~ & Chemistry		1***	1***	1***
	supervisor	(4.4.5)	Chemistry Supervisor		1	1	2
	technician	(4.5.3.1)	Chemistry Technician		2	6	10
Radiation Protection	functional manager	(4.3.3)	Manager, Radiation Protection ~~& Chemistry~~		1***	1***	1***

Radiation Protection

Radiation Protection

Table 13.1-201 Generic Position/Site Specific Position Cross Reference (Sheet 3 of 6) [EF3 COL 13.1-1-A]

Nuclear Function	Function Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents* Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
	supervisor	(4.4.6)	~~Health Physics~~ Supervisor		2	6	8
	technician	(4.5.3.2)	~~Health Physics~~ Technician		4	12	18
Maintenance	manager	(4.2.3)	Manager, Maintenance			1	1
instrumentation and control	supervisor	(4.4.7)	Supervisor, Instrumentation and Control		1	1	1
	supervisor	(4.4.7)	Assistant Supervisor, Instrumentation and Control		2	2	2
	technician	(4.5.3.3)	Instrumentation and Control Technician		4	20	30
mechanical	supervisor	(4.4.9)	Supervisor, Mechanical		1	1	1
	supervisor	(4.4.9)	Assistant Supervisor, Mechanical		2	2	2
	technician	(4.5.7.2)	Mechanic		4	20	30
electrical	supervisor	(4.4.8)	Supervisor, Electrical		1	1	1
	supervisor	(4.4.8)	Assistant Supervisor, Electrical		2	2	2
	technician	(4.5.7.1)	Electrician		4	20	30
Planning and scheduling and outage	manager	(4.2)	Manager, Outage & Planning			1***	1***
	functional manager	(4.3)	Supervisor, Outage & Planning			1	1
	functional manager	(4.3)	Supervisor, Scheduling			1	1

Table 13.1-201 Generic Position/Site Specific Position Cross Reference (Sheet 4 of 6) [EF3 COL 13.1-1-A]

Management

Nuclear Function	Function Position (ANS-3.1-1993 section)	Nuclear Plant Position (Site-Specific)	Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
			Estimated Numbers of Full Time Equivalents*			
	functional manager (4.3)	Supervisor, Planning		1	1	1
Purchasing, and contracts	functional manager (4.3)	Manager, Supply Chain Services		1***	1***	1***
Quality assurance	functional manager (QAPD)	Director, Quality ~~Assurance~~	1***	1***	1***	1***
	functional manager (QAPD)	QA Manager	1	1	1	1
	QA lead auditor (QAPD)	QA Auditor	1	1	1	1
	QA internal auditor (QAPD)	QA Auditor		2	2	8***
	QC inspector (QAPD)	QC Inspector		6	6	4
	supplier auditor (QAPD)	Nuclear Quality Auditor		2	2	1***
	vendor surveillance QC inspector (QAPD)	Vendor Surveillance QC Inspector	2	6	4	4***
	nuclear fuel inspector (QAPD)	Nuclear Fuel Inspector		3***	3***	3***
Training	functional manager (4.3.1)	Manager, Training		1***	1***	1***
	supervisor operations training (4.4.4)	Supervisor, Operations Training		1	1	1
	supervisor, simulator (4.4.4)	Supervisor, Simulator & Training Support		1	1	1
	operations training instructor (4.5.4)	Operations Training Instructor		10	10	10
	supervisor tech staff training (4.4.4)	Supervisor, Tech Training		1	1	1

Table 13.1-201 Generic Position/Site Specific Position Cross Reference (Sheet 5 of 6) [EF3 COL 13.1-1-A]

Nuclear Function	Function Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents* Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
	supervisor maintenance training	(4.4.4)	Supervisor, Maintenance Training		1	1	1
	tech staff/maintenance instructor	(4.5.4)	Tech Staff/Maintenance Instructor		7	7	7
Nuclear safety assurance	manager	(4.2)	Director, ~~Nuclear~~ [Plant] Safety & Licensing		1***	1***	1***
licensing	functional manager	(4.3)	Supervisor, Licensing	1	1	1	1
	licensing engineer	(n/a)	Licensing Engineer	4	4	4	2
corrective action	functional manager	(4.3)	Performance Improvement Manager		1***	1***	1***
	corrective action engineer	(n/a)	Station Nuclear Safety Engineer		1	1	1
Nuclear protection services							
fire protection	supervisor	(4.4)	[Manager, Fire Protection] ~~Supervisor, Protection Services~~		1***	1***	1***
emergency preparedness	functional manager	(4.3)	Manager, Emergency ~~Planning~~ [Preparedness]		1**	1**	1**
	EP planner	(n/a)	EP Specialist		2***	2***	2***
security	functional manager	(4.3)	Manager, Security		1***	1***	1***
	first line supervisor	(4.4)	Supervisor, Nuclear Security		10***	10***	10***
	security officer	(n/a)	Security Officer		100***	100***	100***

Table 13.1-201 Generic Position/Site Specific Position Cross Reference (Sheet 6 of 6) [EF3 COL 13.1-1-A]

Nuclear Function	Function Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents*: Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
Startup testing	supervisor	(4.4.12)	Startup Testing Supervisor		1	3	1
	startup test engineer		Startup Test Engineer		24	10	4
	supervisor	(4.4.11)	Preop Testing Supervisor		2	2	-
	preop test engineer	(n/a)	Preop Test Engineer		8	8	-

Notes:

* Unless otherwise noted, the number in each block represents the estimated number of full time equivalents dedicated to the project.

** The number in this block indicates total positions in the nuclear organization.

*** Shared positions with Fermi Unit 2. Functional manager positiions are expected to allocate time evenly between Fermi 2 and Fermi 3 responsibilities proportionate with related activities. For all other positions, the estimated number of full time equivalents represents an estimate of staff personnel working a full time work schedule for one year on Fermi 3 activities.

**** A senior reactor operator on shift who meets the qualifications for the combined SRO/STA position specified for Option 1 of Generic Letter 86-04 (Reference 13.1-202) may also serve as the STA. If this option is used for a shift, the separate STA position may be eliminated for that shift.

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Startup testing	supervisor	(4.4.12)	Manager, Startup Group		1	1	0

Table 13.1-202 Minimum Shift Staffing for Unit 3 [EF3 COL 13.1-1-A]

Unit Shutdown	1 SM (SRO) 1 RO 1 NLO
Unit Operating*	1 SM (SRO) 1 SRO 2 RO 2 NLO
SM – Shift Manager	RO – Licensed Reactor Operator
SRO – Licensed Senior Reactor Operator	NLO – Non-Licensed Operator

Notes:

In addition, one Shift Technical Advisor (STA) is assigned during plant operation in modes other than cold shutdown or refueling. A shift manager or another SRO on shift, who meets the qualifications for the combined Senior Reactor Operator/Shift Technical Advisor (SRO/STA) position, as specified for option 1 of Generic Letter 86-04 (Reference 13.1-202), the commission's policy statement on engineering expertise on shift, may also serve as the STA. If this option is used for a shift, then the separate STA position may be eliminated for that shift. In addition to the minimum shift organization above, during refueling a licensed senior reactor operator or senior reactor operator limited (fuel handling only) is required to directly supervise any core alteration activity.

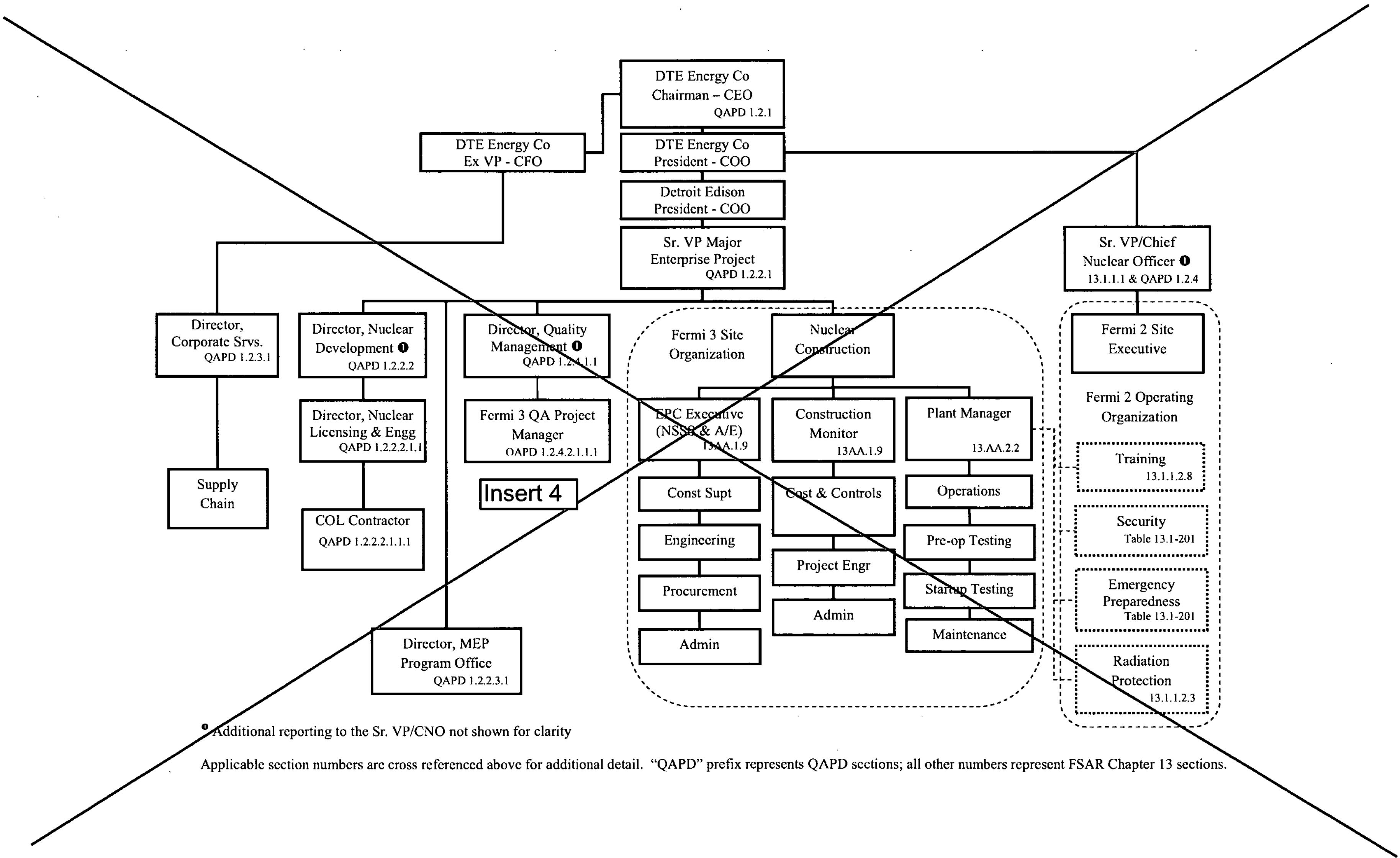
A shift manager/supervisor (licensed SRO), is on site at all times when fuel is in the reactor.

A ~~health physics~~ radiation protection technician is on site at all times when there is fuel in the reactor.

A chemistry technician is on site during plant operation in modes other than cold shutdown or refueling.

* Operating modes other than cold shutdown or refueling.

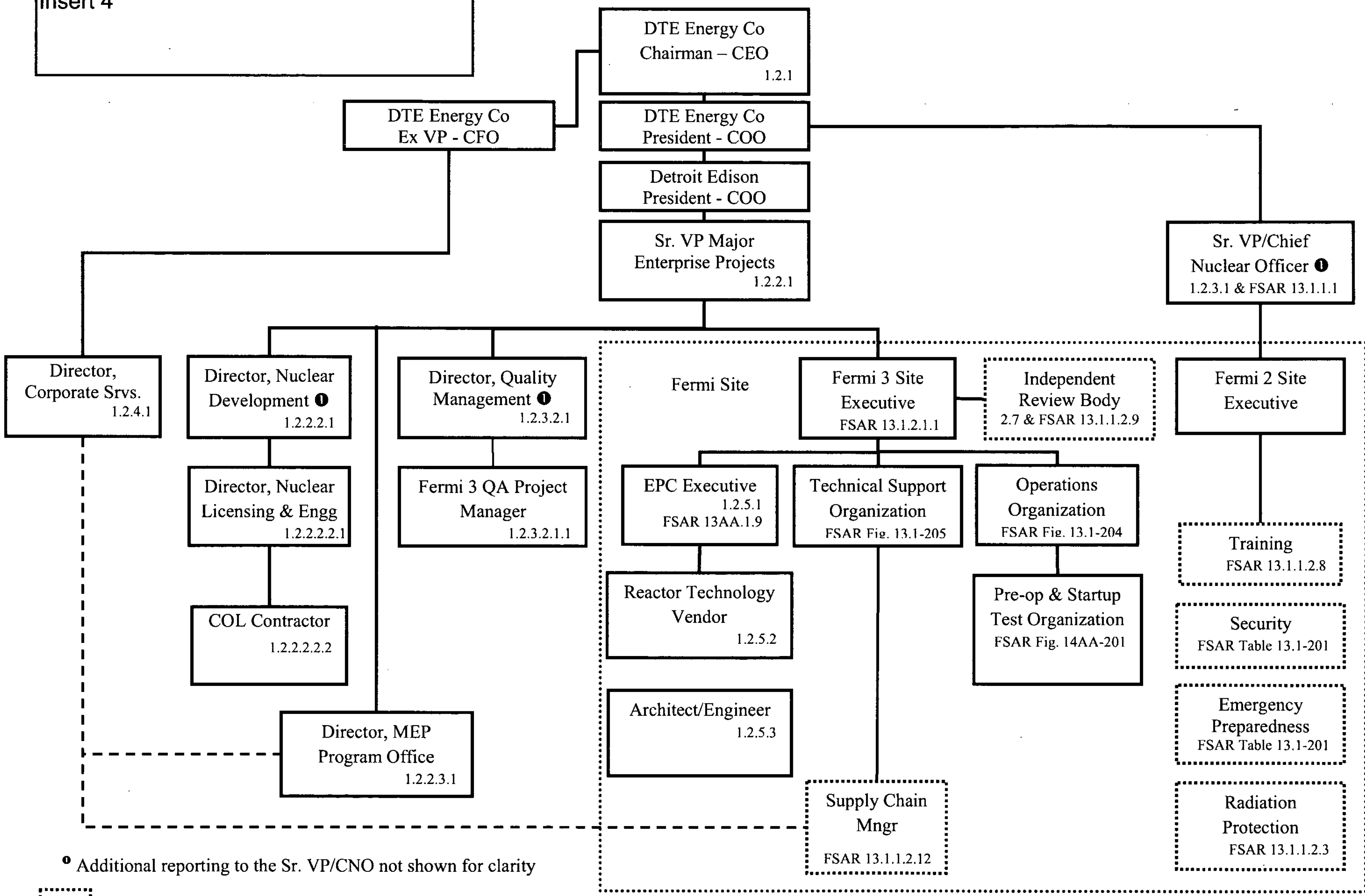
Figure 13.1-201 Design and Construction Organization [EF3 COL 13.1-1-A]



❶ Additional reporting to the Sr. VP/CNO not shown for clarity

Applicable section numbers are cross referenced above for additional detail. "QAPD" prefix represents QAPD sections; all other numbers represent FSAR Chapter 13 sections.

Insert 4



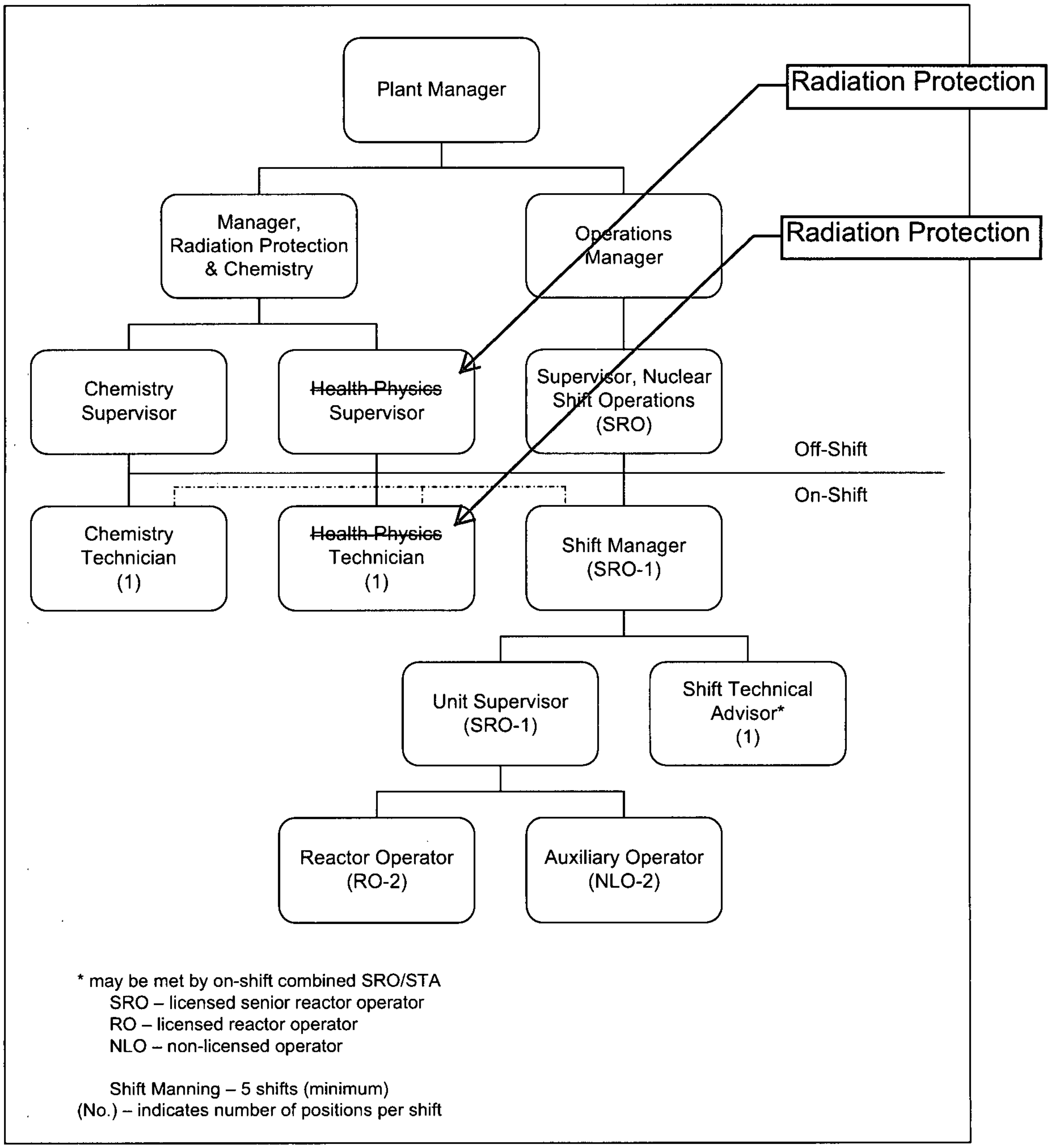
❶ Additional reporting to the Sr. VP/CNO not shown for clarity

[dotted box] Indicates organizations that, although separate, share resources with Fermi 2 but a single management organization provides oversight for Fermi 3

– – – Signifies functional relationship

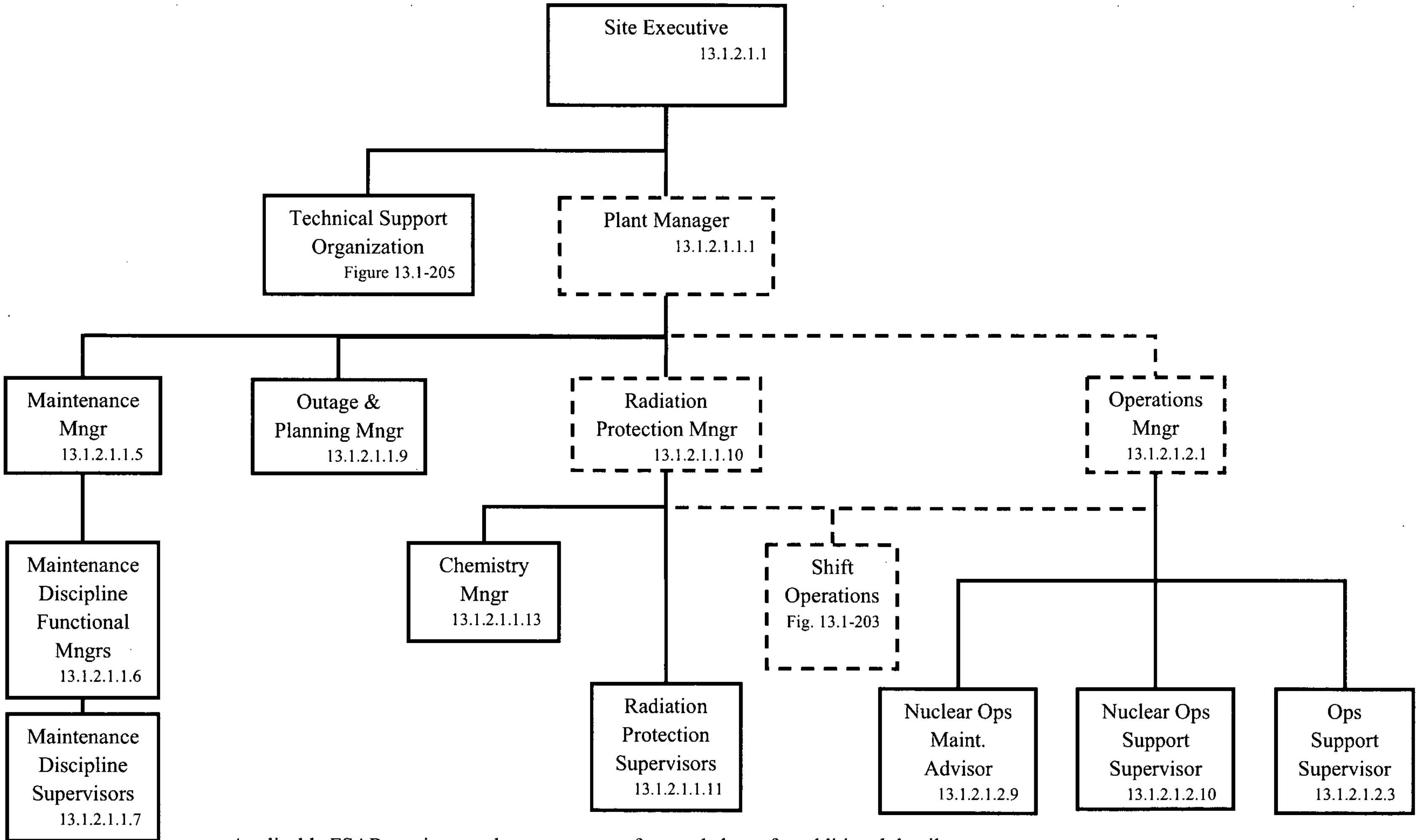
Applicable QAPD section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR indicated cross reference to Chapter 13 section or figure

Figure 13.1-203 Shift Operations [EF3 COL 13.1-1-A]



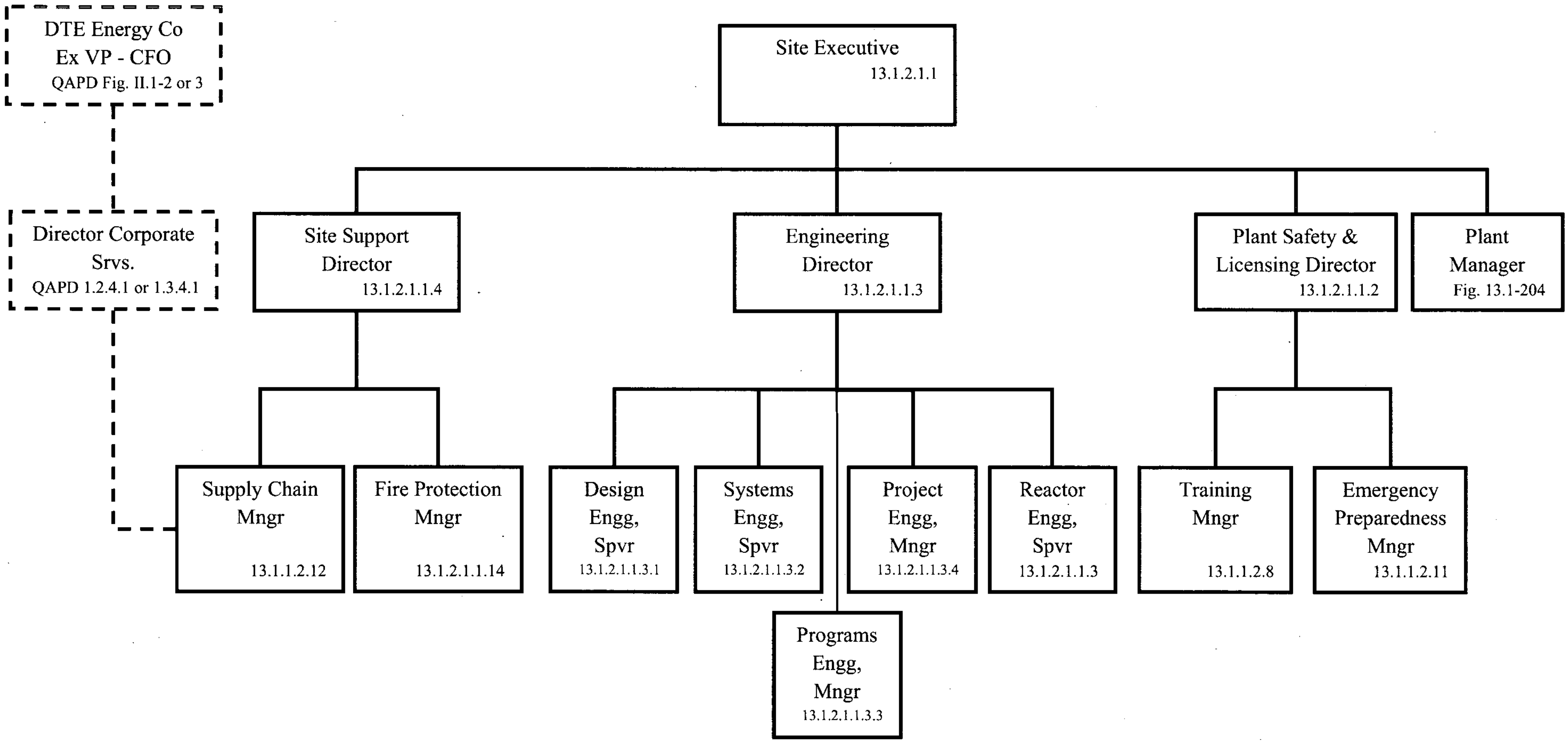
Insert Figures 13.1-204 and 205 after this page

Figure 13.1-204
Fermi 3 Site Organization
(Operations)



Applicable FSAR section numbers are cross referenced above for additional detail.

Figure 13.1-205
Fermi 3 Site Organization
(Technical Support)



- - - Signifies functional relationship

Applicable FSAR section numbers are cross referenced above for additional detail. “QAPD” prefix indicates cross reference to Appendix 17AA section or figure

13.5 Plant Procedure

... uses... fix typo

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

STD SUP 13.5-1 This section describes the administrative and operating procedures that the operating organization (plant staff) u

ses to conduct routine operating, abnormal, and emergency activities in a safe manner.

STD SUP 13.5-2 The QAPD describes procedural document control, record retention, adherence, assignment of responsibilities, and changes.

STD SUP 13.5-3 Procedures are identified in this section by topic, type, or classification in lieu of the specific title, and represent general areas of procedural coverage.

STD SUP 13.5-4 **[START COM 13.5-001]** Procedures are developed prior to fuel load to allow sufficient time for plant staff familiarization and to allow NRC staff adequate time to review the procedures and to develop operator licensing examinations. **[END COM 13.5-001]**

EF3 COL 13.5-4-A Industry guidance for the appropriate format, content, and typical activities delineated in written procedures is implemented, as appropriate. Guidance is based on ASME NQA-1, “Quality Assurance Requirements for Nuclear Facility Applications” (Reference 13.5-202).

STD SUP 13.5-5 The format and content of procedures are controlled by administrative procedure(s). Procedures are organized to include the following components, as necessary:

- Title Page
- Table of Contents
- Scope and Applicability
- Responsibilities

Attachment 9
NRC3-10-0016

Response to RAI Letter No. 25
(eRAI Tracking No. 4378)

RAI Question No. 17.5-11

NRC RAI 17.5-11

SRP Section 17.5 part II, subsection A, "Organization," states that the applicant's QAPD should 1) contain an organizational description that addresses the organizational structure, functional responsibilities, levels of authority, and interfaces, 2) include the onsite and offsite organizational elements that function under the cognizance of the QA program, 3) define the interface responsibilities for multiple organizations.

The NRC endorsed Nuclear Energy Institute (NEI) QAPD template (NEI 06-14, Revision 7, "Quality Assurance Program Description") as a method for providing a QAPD that meets the requirements of 10 CFR Part 50, Appendix B.

Attachment 6 to NRC3-09-0027, "Detroit Edison Company Response to NRC RAI Letter No. 10," dated September 30, 2009, states FSAR Appendix 17AA, Part II, Section 1, Fermi 3 QAPD "Organization" will be revised to reflect NEI 06-14, Revision 7.

Proposed changes to the Fermi 3 QAPD (FSAR Appendix 17AA) Part II, Section 1, provided as part of Insert 1 of Attachment 5 to NRC3-09-0027, "Detroit Edison Company Response to NRC RAI Letter No.10," dated September 30, 2009, state, in the third paragraph, that Design, engineering and environmental services may be provided to the Fermi 3 Nuclear Development organization by suppliers.

Please describe the title, role, and interfaces for each of the primary contractors for each phase described in the organization section of the QAPD, and annotate their position in the appropriate organizational chart, or provide justification for any exceptions to the guidance provided in SRP Section 17.5 part II, subsection A, and NEI 06-14, Revision 7.

Additionally, please provide supplier names and locations for previous or current primary contractors, or provide justification for not including the information. This is information is included as part of NEI 06-14, Part II, Section 1, second to last paragraph of the opening section.

Note: This RAI is supplemental to RAI 17.5-5 and RAI 17.5-6 included in NRC RAI Letter No. 10, dated August 12, 2009.

Response

The primary contractors are identified in FSAR Section 1.4. Revision 2, dated March 2010, states:

> *1.4.1 Detroit Edison Company*
>
> *Detroit Edison is the applicant for the COL, and Detroit Edison will be the licensee authorized to construct and operate Fermi 3. Detroit Edison is therefore responsible for making each of the key project decisions, including the ultimate decision on whether to build a new nuclear power plant, and would be the plant operator.*

> *Detroit Edison has selected GE-Hitachi Nuclear Energy Americas, LLC (GEH) as its primary contractor for the design of the unit. [START COM 1.4-001] The primary contractor for site engineering has not been selected at the time of COLA submittal; this information will be supplied in an FSAR update following selection. [END COM 1.4-001] Detroit Edison has responsibility for the operation of the unit. The following sections provide information on the experience and qualifications of the aforementioned agents and contractors as well as the division of responsibility between Detroit Edison and its agents and contractors.*
>
> *1.4.2 GE-Hitachi Nuclear Energy Americas, LLC (GEH)*
>
> *GEH is responsible for developing the complete standard plant for the ESBWR necessary to obtain a DC from the NRC, supporting preparation of the COL application, and activities to support deployment of the ESBWR on the Fermi site. . . . . . . Various subcontractors are supporting GEH.*
>
> *1.4.2.1 Construction of the Turbine Island and Nuclear Island*
>
> *The contractors for the construction of the turbine island and the nuclear island have not yet been selected. The turbine island and the nuclear island together represent the power block. The contractor for the construction of the turbine island will be responsible for the erection and delivery of the turbine building, the electric building, and the contents of each building. The contractor for the construction of the nuclear island will be responsible for the erection and delivery of the reactor and fuel building, the control building, the hot machine shop, the radwaste building, and the contents of each building. Each contractor will be selected based on their historical work in the nuclear industry, ongoing nuclear business, ability to deliver integrated engineering and construction services, and available resources.*
>
> *1.4.3 Black & Veatch*
>
> *Black & Veatch served as primary contractor for development of the COL application, supplying engineering support, conceptual design, environmental impact assessments, and project management. Black & Veatch, based in Overland Park, KS, ...*

Additionally, FSAR Subsection 1.4.4 contains a listing of "Other Contractors," including: Professional Service Industries, Inc. (PSI), Boart Longyear, and Geomatrix. These three organizations were and are subcontractors of Black & Veatch, described in FSAR Subsection 1.4.3.

FSAR Section 1.4 is being revised to list Professional Service Industries, Inc. (PSI), Boart Longyear, and Geomatrix as major subcontractors of Black & Veatch as shown in the attached markup.

The interfaces for each of the primary contractors, the reactor technology vendor, the COLA contractor, and the Engineering, Procurement and Construction (EPC) contractor and their position in the appropriate organizational chart were provided in the revision to Appendix 17AA, Figure II.1-1, "Fermi 3 Pre-COL Organization", and Figure II.1-2, "Design and Construction Organization."

An EPC contractor with an EPC executive was added to Appendix 17AA, Part II, Subsection 1.2.5 and 1.2.5.1. This organizational element provides a single point of contact for Detroit Edison and is accountable to the site executive described in FSAR Subsection 13AA.1.9. The EPC executive retains and exercises responsibility for the scope and implementation of the EPC contractor's QA program. The EPC Executive shall have sufficient authority to accomplish those parts of the overall QA program for which the EPC contractor is responsible including responsibility and authority to stop unsatisfactory work and control of further processing, delivery, installation, or use of nonconforming items. The EPC executive shall ensure that the applicable portion of the EPC contractor's or any subcontractor or vendor's QA program is properly documented, approved, and implemented (people are trained and resources are available) before any activity within the scope of the QA program is undertaken. The EPC executive shall ensure that the size of the EPC contractor's QA organization is commensurate with its duties and responsibilities. The EPC executive may assign responsibility for ensuring effective execution for any portion of the EPC contractor's QA program but shall ensure that authority, as may be necessary to perform the function, is provided. The EPC contractor's QA program is binding on all participating organizations, including all employees or contractors whose activities may influence quality.

Pointers to FSAR Section 1.4 are being inserted as necessary in the Fermi 3 Quality Assurance Program Description (QAPD) presented in Appendix 17AA.

The EPC contractor has not been identified (see FSAR Subsection 13AA.1).

Proposed COLA Revision

Appendix 17AA, Figure II.1-1, "Fermi 3 Pre-COL Organization", and Figure II.1-2, "Design and Construction Organization" have been revised to provide the interfaces for each of the primary contractors, the reactor technology vendor, the COLA contractor and the EPC contractor as shown in the attached markup. The markup to Appendix 17AA, "Fermi 3 Quality Assurance Program Description" provided with RAI 17.5-12 in Attachment 10 also reflects these changes.

FSAR Section 1.4 is being revised to list Professional Service Industries, Inc. (PSI), Boart Longyear, and Geomatrix as major subcontractors of Black & Veatch as shown in the attached markups.

Pointers to FSAR Section 1.4 have been inserted in the Fermi 3 QAPD presented in Appendix 17AA as shown in the attached markups. The markup to Appendix 17AA, "Fermi 3 Quality Assurance Program Description" provided with RAI 17.5-12 in Attachment 10 also reflects these changes.

Markup of Detroit Edison COLA
(following 22 page(s))

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

1.3 Comparison Tables

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

Add the following at the end of this section.

EF3 COL 1.3-1-A

There are no updates to DCD Table 1.3-1 based on unit specific information.

1.3.1 COL Information

1.3-1-A Update Table 1.3-1

This COL item is addressed in Section 1.3.

1.4 Identification of Agents and Contractors

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

EF3 SUP 1.4-1

1.4.1 Detroit Edison Company

Detroit Edison is the applicant for the COL, and Detroit Edison will be the licensee authorized to construct and operate Fermi 3. Detroit Edison is therefore responsible for making each of the key project decisions, including the ultimate decision on whether to build a new nuclear power plant, and would be the plant operator.

Detroit Edison has selected GE-Hitachi Nuclear Energy Americas, LLC (GEH) as its primary contractor for the design of the unit. **[START COM 1.4-001]** The primary contractor for site engineering has not been selected at the time of COLA submittal; this information will be supplied in an FSAR update following selection. **[END COM 1.4-001]** Detroit Edison has responsibility for the operation of the unit. The following sections provide information on the experience and qualifications of the aforementioned agents and contractors as well as the division of responsibility between Detroit Edison and its agents and contractors.

1.4.2 GE-Hitachi Nuclear Energy Americas, LLC (GEH)

GEH is responsible for developing the complete standard plant for the ESBWR necessary to obtain a DC from the NRC, supporting preparation of the COL application, and activities to support deployment of the

ESBWR on the Fermi site. GEH, established in June 2007, is a business alliance of GE and Hitachi's respective nuclear businesses, established to serve the global nuclear industry.

DCD Table 1.4-1 lists the commercial nuclear reactors that were completed by GE or are under construction by GEH. For 50 years, GE provided advanced technology for nuclear energy. GE developed breakthrough light water technology in the mid-1950s: the Boiling Water Reactor (BWR). Since then, GE developed nine evolutions of BWR technology, including the first operational advanced light water design in the world, the ABWR, and culminating in its latest generation of design, the ESBWR. All of GE's nuclear technology has been transferred to GEH. There are 67 plants operating worldwide utilizing GEH designs with an operating capacity of over 59 GW, including 36 BWR plants in North America. Various subcontractors are supporting GEH.

1.4.2.1 Construction of the Turbine Island and Nuclear Island

The contractors for the construction of the turbine island and the nuclear island have not yet been selected. The turbine island and the nuclear island together represent the power block. The contractor for the construction of the turbine island will be responsible for the erection and delivery of the turbine building, the electric building, and the contents of each building. The contractor for the construction of the nuclear island will be responsible for the erection and delivery of the reactor and fuel building, the control building, the hot machine shop, the radwaste building, and the contents of each building. Each contractor will be selected based on their historical work in the nuclear industry, ongoing nuclear business, ability to deliver integrated engineering and construction services, and available resources.

1.4.3 Black & Veatch

Black & Veatch served as primary contractor for development of the COL application, supplying engineering support, conceptual design, environmental impact assessments, and project management. Black & Veatch, based in Overland Park, KS, is an engineering, environmental, technical, construction services, and management services firm providing a broad range of professional services to private and government sector clients throughout the world since 1915. Black & Veatch's nuclear activities date back to the closing years of World War II with early work including extensive service to the Atomic Energy Commission in the development of facilities at Los Alamos, New Mexico. More recent activities include the development activities for other COLAs, the Advanced Boiling Water Reactor (AWBR) Design Certification Program, and the Department of Energy's 2010 initiative for the deployment of new nuclear plants in the United States.

Various subcontractors are supporting Black & Veatch, including:

Move text up to here

1.4.4 Other Contractors

In addition to the major contractors listed above, contractual relationships were established with several specialized consultants to assist in developing the COLA. Other subcontractors may be added as the need arises.

may be

(after Geomatrix) Other subcontractors may be added as needed

1.4.3.1 Professional Service Industries, Inc. (PSI)

PSI performed laboratory testing in support of Fermi 3 site specific evaluations in Chapter 2 and the Emergency Plan. This effort included laboratory testing of rock and soil materials and water quality.

Environmental Report

1.4.3.2 Boart Longyear

Boart Longyear performed geotechnical field investigations in support of Chapter 2. That effort included performing standard penetration tests; obtaining core samples and rock cores; performing cone penetrometer tests; supporting down-hole seismic tests and laboratory tests of soil and rock samples; installing ground water observation wells; and preparing a data report.

1.4.3.3 Geomatrix

Geomatrix Inc. performed probabilistic seismic hazard assessments and related sensitivity analyses in support of Chapter 2. These assignments included sensitivity analyses of seismic source parameters and updated ground motion attenuation relationships, development of updated Safe Shutdown Earthquake (SSE) ground motion values, and preparation of the related sections.

1.5 Requirements for Further Technical Information

This section of the referenced DCD is incorporated by reference with no departures or supplements.

EPC

responsible for ~~adhering to the~~ fire protection/prevention requirements detailed in Subsection 9.5.1. The ~~site construction~~ executive will have the lead responsibility for overall construction site fire protection during construction. The fire brigade is described in Subsection 13.1.2.1.5.

13.1.1.2.11 Emergency Organization

The emergency preparedness organization is a matrixed organization composed of personnel who have the experience, training, knowledge, and ability necessary to implement actions to protect the public in the case of emergencies. Managers and station personnel assigned to positions in the emergency organization are responsible for supporting the emergency preparedness organization and the emergency plan as required. The staff members of the emergency planning organization administer and orchestrate drills and training to maintain qualification of station staff members, and develop procedures to guide and direct the emergency organization during an emergency. The functional manager in charge of emergency preparedness reports to the director responsible for facility safety and licensing. The site emergency plan organization is described in the Emergency Plan.

13.1.1.2.12 Outside Contractual Assistance

Contract assistance with vendors and outside suppliers is provided by the materials, procurement, and contracts organization. The functional manager in charge of materials, procurement, and contracts reports to the site support director

Resources and management of the materials, procurement, and contracts organization are shared between units.

13.1.1.3 Organizational Arrangement

Organizational arrangement for corporate offices and site organizations reporting directly to corporate offices is presented in Section 17.5.

13.1.1.4 Qualifications of Technical Support Personnel

Personnel of the technical support organization meet the education and experience qualifications for those described in ANSI/ANS-3.1 (Reference 13.1-201) as endorsed and amended by RG 1.8.

13.1.2 Operating Organization

13.1.2.1 Plant Organization

Lundy, Stone & Webster, Parsons Company and Daniels Construction Company.

In addition, Detroit Edison has been responsible for the design, construction, and operation of several large fossil stations, activities of similar scope and complexity. With an 11,000 megawatt system capacity, the company has been associated with the construction and generation of power facilities such as coal, nuclear, natural gas and hydroelectric pumped storage. An example is the Belle River coal faci

EPC contractor responsible

generates in excess of 1000 MW.

the reactor technology vendor

Detroit Edison's management, engineering, and technical support organization for the construction and operation of Fermi 3 are described in Chapter 17 and Chapter 13, respectively. As described in Subsection 1.4.1, Detroit Edison has selected General Electric Hitachi (GEH) as ~~its primary contractor~~ for the design of Fermi 3. The ~~primary contractors~~ for site engineering, and construction of the nuclear and turbine islands ~~have~~ not yet been selected.

, has

Other design and construction activities will be contracted to qualified suppliers of such services. Implementation or delegation of design and construction responsibilities is described in the sections below. Quality Assurance aspects are described in Chapter 17.

13AA.1.1 Principal Site-Related Engineering Work

The principal site engineering activities accomplished towards the construction and operation of the plant are:

Meteorology

Information concerning local (site) meteorological parameters is developed and applied by station and contract personnel to assess the impact of the station on local meteorological conditions. An onsite meteorological measurements program is employed by station personnel to produce data for the purpose of making atmospheric dispersion estimates for postulated accidental and expected routine airborne releases of effluents. A maintenance program is established for surveillance, calibration, and repair of instruments. More information regarding the study and meteorological program is found in Section 2.3.

Geology

the reactor technology vendor's QA program and

Environmental Effects

Monitoring programs are developed to enable the collection of data necessary to determine possible impact on the environment due to construction, startup, and operational activities and to establish a baseline from which to evaluate future environmental monitoring. This program is described in the separately submitted Environmental Report.

technology

13AA.1.2 Design of Plant and Ancillary Systems

Design and construction of systems outside the power block such as circulating water, service water, switchyard, and secondary fire protection systems are performed by Detroit Edison or qualified contractors, as assigned.

13AA.1.3 Review and Approval of Plant Design Features

Design engineering review and approval is performed in accordance with Chapter 17. The reactor vendor is responsible for design control of the power block. ~~Design work is performed in accordance with the design and construction QA manual including the reviews necessary to verify the adequacy of the design.~~ Verification is performed by competent individuals or groups other than those who performed the original design. Design issues arising during construction are addressed and implemented with notification and communication of changes to the ~~manager in charge of engineering~~ for review. As systems are tested and approved for turnover and operation, control of design is turned over to plant staff. The manager in charge of engineering, along with functional managers and staff, assumes responsibility for review and approval of modifications, additions, or deletions in plant design features, as well as control of design documentation, in accordance with ~~the Operational QA Program~~. Design control becomes the responsibility of the manager in charge of engineering prior to loading fuel. During construction, startup, and operation, changes to human-system interfaces of control room design are approved using a Human Factors Engineering evaluation addressed within DCD Chapter 18. See Figure 13.1-201, Construction Organization,Subsection 13AA.1.9, Subsection 13AA.2.2, and the QAPD (incorporated into Section 17.5) for reporting relationships.

A/E within the EPC organization

Chapter 17

Major Enterprise Projects

EPC

from the construction organization, the oversight organization has functional access to the Senior VP, Major Enterprise Projects.

Monitoring and review of construction activities is divided functionally across the various disciplines of ~~the utility construction staff~~, i.e. electrical, mechanical, instrument and control, etc., and tracked by schedule based on system and major plant components/areas.

EPC

After each system is turned over to plant staff the ~~construction~~ organization relinquishes responsibility for that system. At that time the ~~construction~~ organization will be responsible for completion of construction activities as directed by plant staff and available to provide support for start-up testing as necessary.

13AA.2 **Preoperational Activities**

This section describes the activities required to transition the unit from the construction phase to the operational phase. These activities include turnover of systems from construction, preoperational testing, schedule management, test procedure development, fuel load, integrated startup testing, and turnover of systems to plant staff.

Insert 5

insert 5

The plant manager, with the aid of those managers that report to the plant manager (see Figure 13.1-204), the technical support staff (see Figure 13.1-205), and the aid of the manager in charge of the Startup group (see Figure 14AA-201), is responsible for the activities related to the transition from the construction phase to the operational phase. These activities include preoperational testing, schedule management, procedure development for tests, fuel load, integrated startup testing, and turnover of systems to the operations staff.

During construction initial testing, the Engineering, Procurement and Construction (EPC) contractor is responsible for equipment maintenance. To ensure equipment operability and reliability, plant maintenance programs such as preventative and corrective maintenance are developed prior to system turnover and become effective as each system is turned over from the EPC contractor to the operating and technical staff with approved administrative procedures under the direction of the manager in charge of maintenance, the Engineering Director, and work control.

technical support staff, EPC personnel including the reactor technology vendor and A/E staff,

The Startup Group has two internal groups: the Preoperational Test Group, which is responsible for conducting and documenting preoperational tests; and the Startup Test Group, which is responsible for conducting and documenting initial startup testing. Both groups consist of personnel drawn from various organizations such as plant staff, ~~construction personnel, GEH~~, and other contractors, vendors and consultants.

The manager in charge of the Startup Group reports to the plant manager and has the qualifications of Preoperational Testing Supervisor as set forth in Table 13.1-201.

The Preoperational Test Group consists of Preoperational Testing Supervisors (i.e., NSSS, BOP, Electrical, and others, as required), each of whom reports to the manager in charge of the Startup Group. Preoperational Testing Engineers are assigned to this group and report to one of the Preoperational Testing Supervisors. Qualifications of Preoperational Testing Supervisors and Preoperational Testing Engineers are set forth in Table 13.1-201.

The Startup Test Group consists of Startup Testing Supervisors who report to the manager in charge of the Startup Group. Startup Test Engineers are assigned to this group and report directly to one of the Startup Testing Supervisors. Qualifications of Startup Testing Supervisors and Startup Test Engineers are set forth in Table 13.1-201. Figure 14AA-201 illustrates the organizational structure of the Startup Group.

14AA.2.2 **Responsibilities**

The manager in charge of Operations coordinates with the manager in charge of the Startup Group during the ITP to provide operations personnel to coordinate, support, and participate in preoperational testing. The manager in charge of Operations is a voting member of the Joint Test Group (JTG) and the Independent Review Body (IRB). The manager in charge of Operations is responsible for safe operation of the plant and ensuring tests are performed efficiently and effectively

- Reviewing, approving and tracking document changes (including drawings, vendor tech manuals, procedures, design changes, etc.).
- Verifying that the test schedules are up to date with regard to latest testing results.
- Processing final test packages through review and approval by the IRB.

reactor technology vendor

14AA.2.2.10 **Independent Review Body**

Upon initial fuel load, the IRB assumes responsibility for tasks previously assigned to the JTG. The IRB is responsible for review of all procedures that require a regulatory evaluation under 10 CFR 50.59 and 10 CFR 72.48, as well as all tests and modifications that affect nuclear safety. The IRB is responsible for review of all startup test procedures.The organizational structure, functions, and responsibilities of IRB are described in Appendix 17AA. During the startup test phase, the IRB is advised by the manager in charge of the Startup Group and the ~~GEH~~ resident site manager. The IRB may be addressed by other titles such as Plant Operations Review Committee (PORC), On-site Safety Review Committee, or Plant Safety Review Committee (PSRC).

14AA.2.3 **Operating and Technical Staff Participation**

~~Operating and technical s~~taff qualifications and experience requirements are: S

Plant staff qualification and experience requirements are in

Chapter 13 and in this appendix.

EPC contractor

EPC contractor

- Contractor qualification and experience requirements are in this appendix and in approved contractor procedures.
- Vendor staff qualification and experience requirements are in this appendix and in approved vendor procedures.
- ~~Architect Engineer~~ staff qualification and experience requirements are in this appendix and in approved ~~Architect Engineer~~ procedures.

Plant staff participate~~s~~ in all phases of the ITP. Plant staff groups that participate include but are not limited to: Quality Assurance staff, Quality Control staff, Operations staff, Maintenance staff, Engineering staff, Planning, Scheduling and Outage planning staff, and Work Management staff, including work planners and schedulers. Operations staff participates in preoperational testing as part of gaining experience as

- Reset high-flux trips, just prior to ascending to the next level, to a value no greater than 20 percent beyond the power of the next level unless Technical Specification limits are more restrictive.
- Perform general surveys of plant systems and equipment to confirm that they are operating within expected values.
- Check for unexpected radioactivity in process systems and effluents.
- Perform reactor coolant leak checks.
- Review the completed testing program at each plateau; perform preliminary evaluations, including extrapolation core performance parameters for the next power level; and obtain the required management approvals before ascending to the next power level or test condition.

Upon completion of a given test, a preliminary evaluation is performed that confirms acceptability for continued testing. Smaller transient changes are performed initially, gradually increasing to larger transient changes. Test results at lower powers are extrapolated to higher power levels to determine acceptability of performing the test at higher powers. This extrapolation is included in the analysis section of the lower power procedure.

Surveillance test procedures may be used to document portions of tests, and ITP tests or portions of tests may be used to satisfy Technical Specifications surveillance requirements in accordance with administrative procedures. At Startup Test Program completion, a plant capacity warranty test is performed to satisfy the contract warranty and to confirm safe and stable plant operation.

EPC contractor

14AA.4.8 Conduct of Modifications during the Initial Test Program

Temporary modifications may be required to conduct certain tests. These modifications are documented in the test procedure. The test procedures contain restoration steps and retesting required to confirm satisfactory restoration to required configuration. Modifications may be performed by the ~~Construction organization~~ or the plant staff processes prior to NRC issuance of the 10 CFR 52.103(g) finding. If the modification invalidates a previously completed ITAAC, then that ITAAC is re-performed. Each modification is reviewed to determine the scope of post-modification testing that is to be performed. Testing is conducted and documented to ensure that preoperational testing and ITAAC remain valid. Modifications

The reactor technology vendor, identified in FSAR Subsection 1.4.2, reports to the Director, Nuclear Licensing and Engineering and

1.1.2.2.2.1 **Director, Nuclear Licensing and Engineering**

The Director, Nuclear Licensing and Engineering reports to the Director Nuclear Development and is responsible for the administration of engineering and nuclear licensing for Fermi 3 under the QAPD.

1.1.2.2.2.2 ~~**NSSS**~~ Reactor Technology Vendor

~~The Nuclear Steam Supply System (NSSS) vendor~~ supports the COL application through the review and subsequent approval of the Design Certification application for the selected standard design. A QAPD submitted by the Design Certification application covering design QA activities in support of the COL application would be implemented under the QAPD submitted by the NSSS vendor and reviewed and approved by the NRC as part of the Design Certification reviews.

1.1.2.2.2.3 **COLA Contractor**

, identified in FSAR Subsection 1.4.3, reports to the Director, Nuclear Licensing and Engineering and

The COLA Contractor provides engineering services for the development of the COL application. These engineering services include site-specific license engineering, and design activities necessary to support development of the COL application in accordance with the COLA Contractor's 10 CFR 50 Appendix B/NQA-1 QAPD, as established contractually to assure that applicable regulatory requirements necessary to assure adequate quality are satisfied. The COLA Contractor also provides engineering services in planning and support for preconstruction activities for Fermi 3.

1.1.2.3 **MEP Program Office**

The MEP Program Office is responsible for supporting the Nuclear Development organization through performing activities related to procurement, budget, planning, etc. where applicable.

1.1.2.3.1 **Director, MEP Program Office**

The Director, MEP Program Office reports to the Sr. VP MEP and is responsible for managing the MEP support functions for Nuclear Development activities in accordance with the QAPD.

1.1.3.1 **Senior Vice President / Chief Nuclear Officer**

The Senior Vice President/Chief Nuclear Officer (CNO) ultimately reports to the Chairman and CEO and is responsible for the overall administration of Detroit Edison nuclear plants. The CNO is the ultimate management authority for establishing QA policy and responsibility for the QA function. The CNO will support Nuclear Development activities through the Director, Nuclear Development and the Director, Quality Management.

1.1.3.2 **Quality Assurance**

The Quality Assurance organization is responsible for independently planning and performing activities to verify the development and effective implementation of the Fermi 3 QAPD including through construction. The Sr. VP MEP is also responsible for establishing and managing contracts for the development of new nuclear generation. The Sr. VP MEP shall transition the Nuclear Development organization through the Pre-COL / Design and Construction / Operations responsibilities described in the QAPD, as those Fermi 3 activities commence.

1.2.2.2.1 Director, Nuclear Development

The Director, Nuclear Development reports to the Sr. VP MEP and to the CNO and is responsible for the implementation of quality assurance requirements in the areas specified by the QAPD. For the purposes of this program, the description of the duties of the Director Nuclear Development and the Nuclear Development staff will be limited to those activities that support the Fermi 3 Design and Construction activities.

1.2.2.2.2 Nuclear Development, Nuclear Licensing and Engineering

The Nuclear Development Licensing and Engineering (NDLE) organization is responsible for support of the Nuclear Development organization by providing engineering, licensing and document control support where applicable.

1.2.2.2.2.1 Director, Nuclear Licensing and Engineering

The Director, Nuclear Licensing and Engineering reports to the Director Nuclear Development and is responsible for the administration of engineering, nuclear fuel and nuclear licensing and support activities for Fermi 3 under the QAPD.

1.2.2.2.2.2 COL Contractor

, identified in FSAR Subsection 1.4.3, reports to the Director, Nuclear Licensing and Engineering and

The COL Contractor provides engineering services in support of licensing activities necessary to support updates, changes, etc. to the COL. These engineering services include site-specific license engineering, and design activities necessary to support development of proposed COL updates, changes etc., and planning and support for preconstruction and construction of Fermi 3.

1.2.2.3 **MEP Program Office**

The MEP Program Office is responsible for supporting the Nuclear Development organization through performing activities related to procurement, budget, planning, etc. where applicable.

1.2.2.3.1 **Director, MEP Program Office**

The Director, MEP Program Office reports to the Sr. VP MEP and is responsible for managing the MEP support functions for Nuclear Development activities in accordance with the QAPD.

~~1.2.3~~ ~~**Corporate Services**~~

~~The Corporate Services organization is responsible for supporting the Nuclear Development organization through performing activities related to procurement, contract management, business performance, records management, logistics, etc., where applicable.~~

The reactor technology vendor, indentified in FSAR Subsection 1.4.2,

systems, structures and components (SSC), or portions thereof to support transfer from the construction contractor to the cognizant owner departments as described in FSAR Appendix 13AA, Section 13AA.2.2.

Insert 9 (2 pgs)

1.2.5.2 ~~NSSS~~ Reactor Technology Vendor

~~NSSS~~ provides engineering services for plant design and licensing of Fermi 3 on the Detroit Edison site. These engineering services for Fermi 3 include site-specific engineering and design necessary to support preconstruction and construction activities associated with the nuclear steam supply system (NSSS), i.e. the certified portion of the design.

1.2.5.3 ~~A/E~~ Architect/Engineer (A/E)

The A/E Firm provides engineering services for ~~the development of the COL application~~ the remaining plant design and licensing of Fermi 3 on the Detroit Edison Site. These engineering services include ~~site-specific license engineering, and design activities necessary to support development of the COL application, and planning and support for preconstruction and construction activities~~ site specific support of the reactor technology vendor, design of other support facilities not provided by the reactor technology vendor, site planning and associated activities, preconstruction planning, and construction support for Fermi 3.

, identified in FSAR Subsection 1.4.2.1,

1.2.6 Authority to Stop Work

Quality assurance and inspection ... work in progress which is not being performed in accordance with approved procedures or where safety or SSC integrity may be jeopardized. This extends to off-site work performed by suppliers that furnish safety-related materials and services to Fermi 3.

1.2.7 Quality Assurance Organizational Independence

For the Design and Construction phase, independence shall be maintained between the organization or organizations performing the checking (quality assurance and control) functions and the organizations performing the functions. This provision is not applicable to design review/verification.

1.2.8 NQA-1-1994 Commitment

In establishing its organizational structure, Fermi 3 commits to compliance with NQA-1-1994, Basic Requirement 1 and Supplement 1S-1.

1.3 Fermi 3 Operational Organization

This section describes the organizational structure for the operational activities of Fermi 3 and the Fermi 3 Site organizational structure is shown in Figure II.1-3.

1.3.1 Chairman and CEO

The Chairman/CEO is responsible for all aspects of design, construction and operation of Detroit Edison's nuclear plants as described in Section 1.1.1

1.3.2.1 Senior Vice President / CNO

Insert 9 (pg 1 of 2)

1.2.5 Engineering Procurement and Construction (EPC) Contractor
The EPC contractor is contracted to deliver a commissioned nuclear generating unit to Detroit Edison and includes as key elements the reactor technology vendor and the Architect/Engineer (AE) (see FSAR Appendix 13AA).

1.2.5.1 Engineering Procurement Construction Executive
The EPC Executive retains and exercises responsibility for the scope and implementation of the EPC contractor's QA program. The EPC Executive shall have sufficient authority to accomplish those parts of the overall QA program for which the EPC contractor is responsible including responsibility and authority to stop unsatisfactory work and control of further processing, delivery, installation, or use of nonconforming items. The EPC executive shall ensure that the applicable portion of the EPC contractor's or any subcontractor or vendor's QA program is properly documented, approved, and implemented (people are trained and resources are available) before any activity within the scope of the QA program is undertaken. The EPC contractor shall ensure that the size of the EPC contractor's QA organization is commensurate with its duties and responsibilities. The EPC executive may assign responsibility for ensuring effective execution for any portion of the EPC contractor's QA program but shall ensure that authority as may be necessary to perform the function is provided. The EPC contractors QA program is binding on all participating organizations, including all employees or contractors whose activities may influence quality.

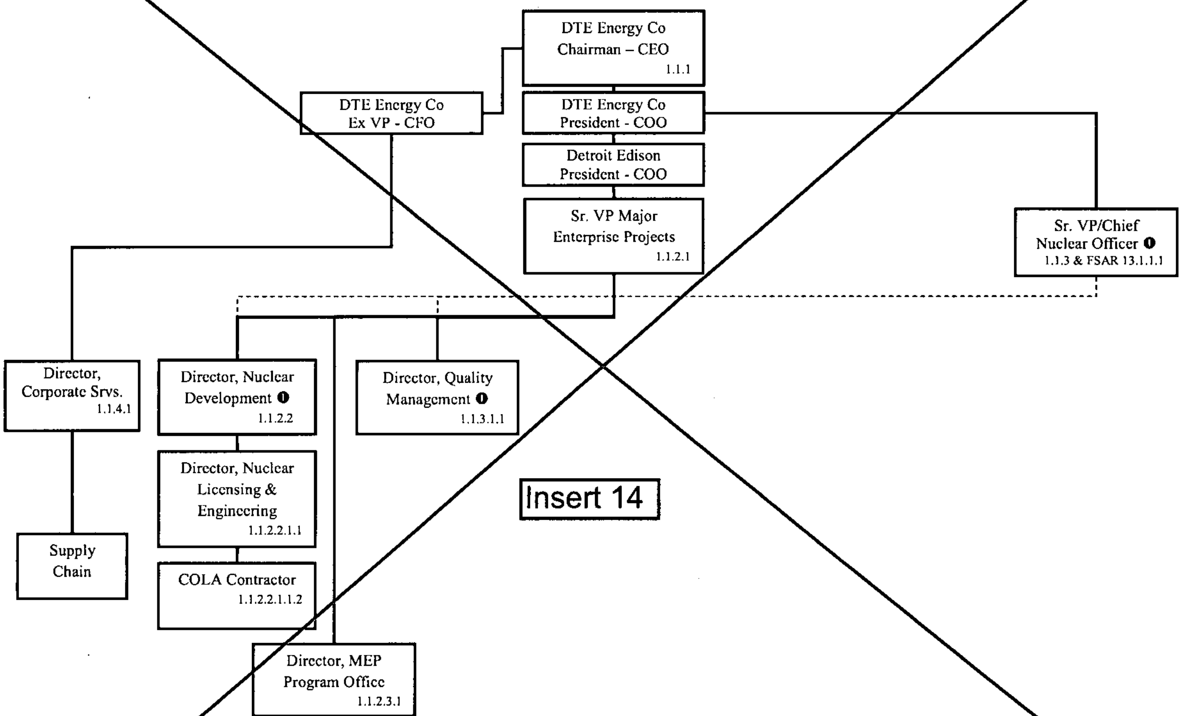
The EPC contractor's QA performance shall be formally evaluated by the Fermi 3 3 Quality Assurance Project Manager.

The EPC Executive provides a single point of contact for Detroit Edison and accountable to the site executive as described in FSAR Section 13AA.1.9.

Insert 9 (pg 2 of 2)

Controls and lines of communication between the site executive and the EPC Executive shall be identified and documented. Responsibility for QA functions and the extent of oversight shall be clearly established.

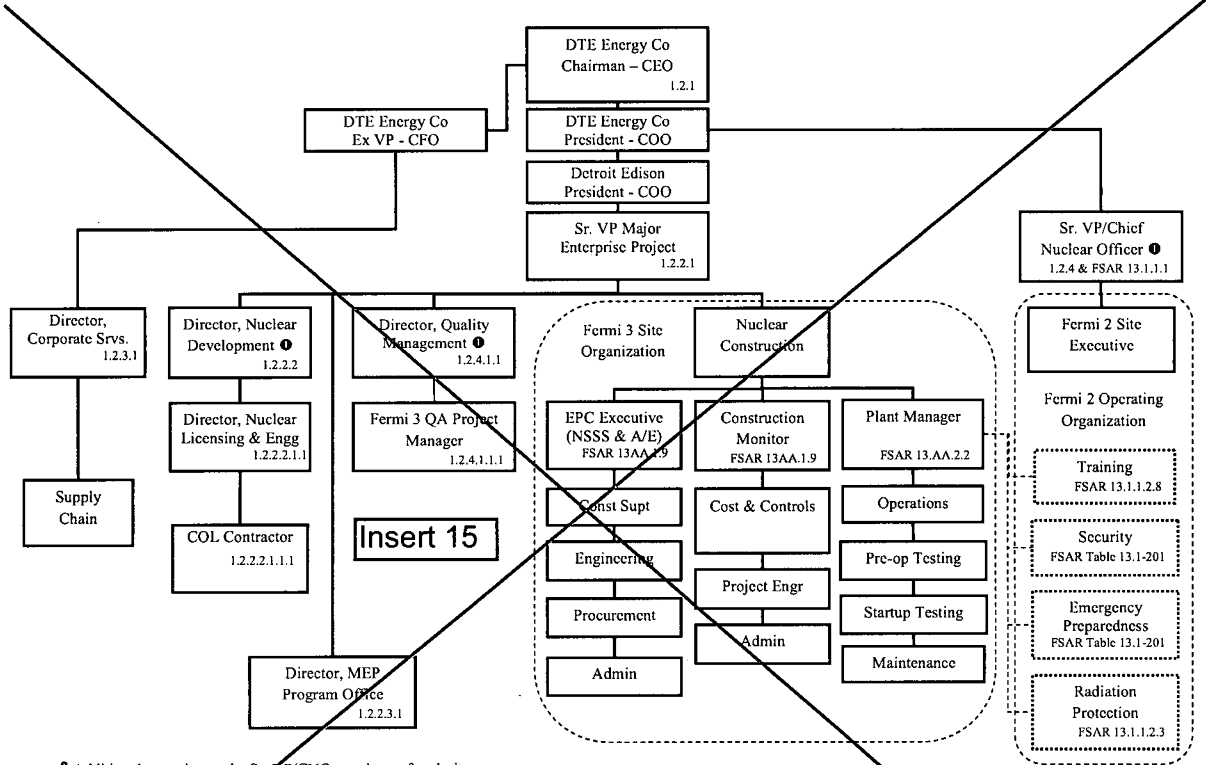
Figure II.1-1 Fermi 3 Pre-COL Organizational Structure



❶ Additional reporting to the Sr. VP/CNO

Applicable section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR Chapter 13 sections; all other numbers represent QAPD sections.

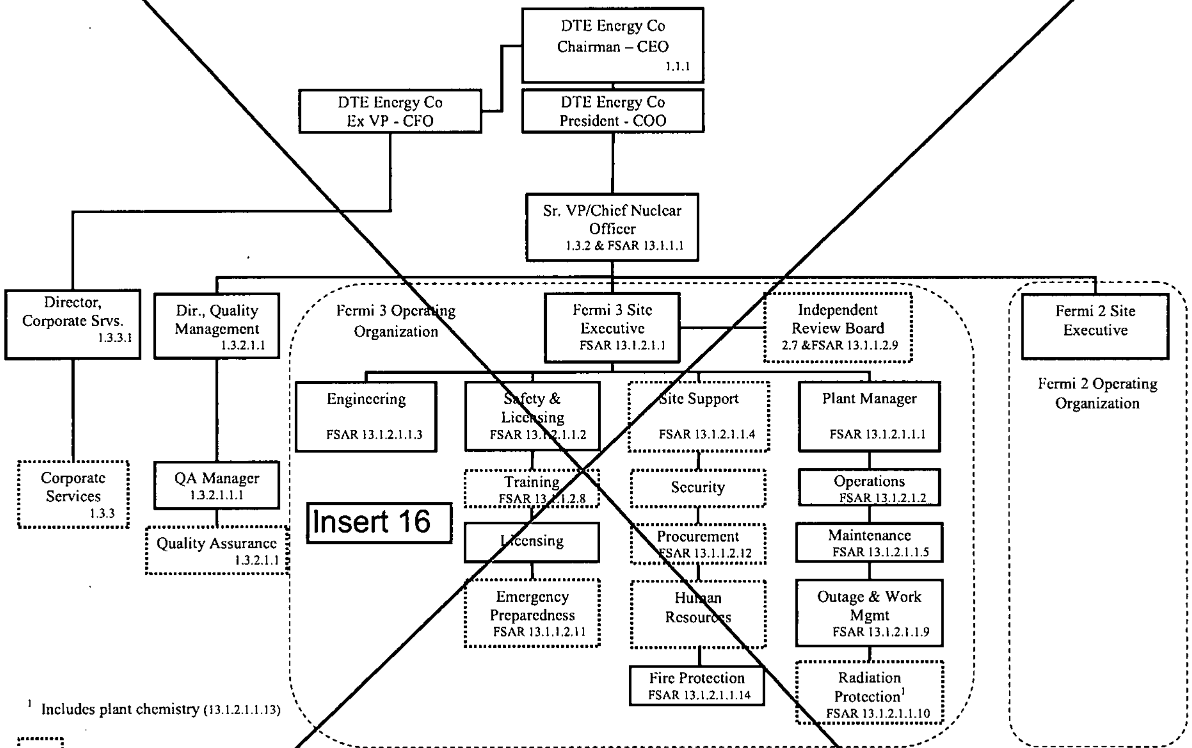
Figure II.1-2 Design and Construction Organization



❶ Additional reporting to the Sr. VP/CNO not shown for clarity

Applicable section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR Chapter 13 sections; all other numbers represent QAPD sections.

Figure II.1-3 Fermi 3 Operating Organizational Structure



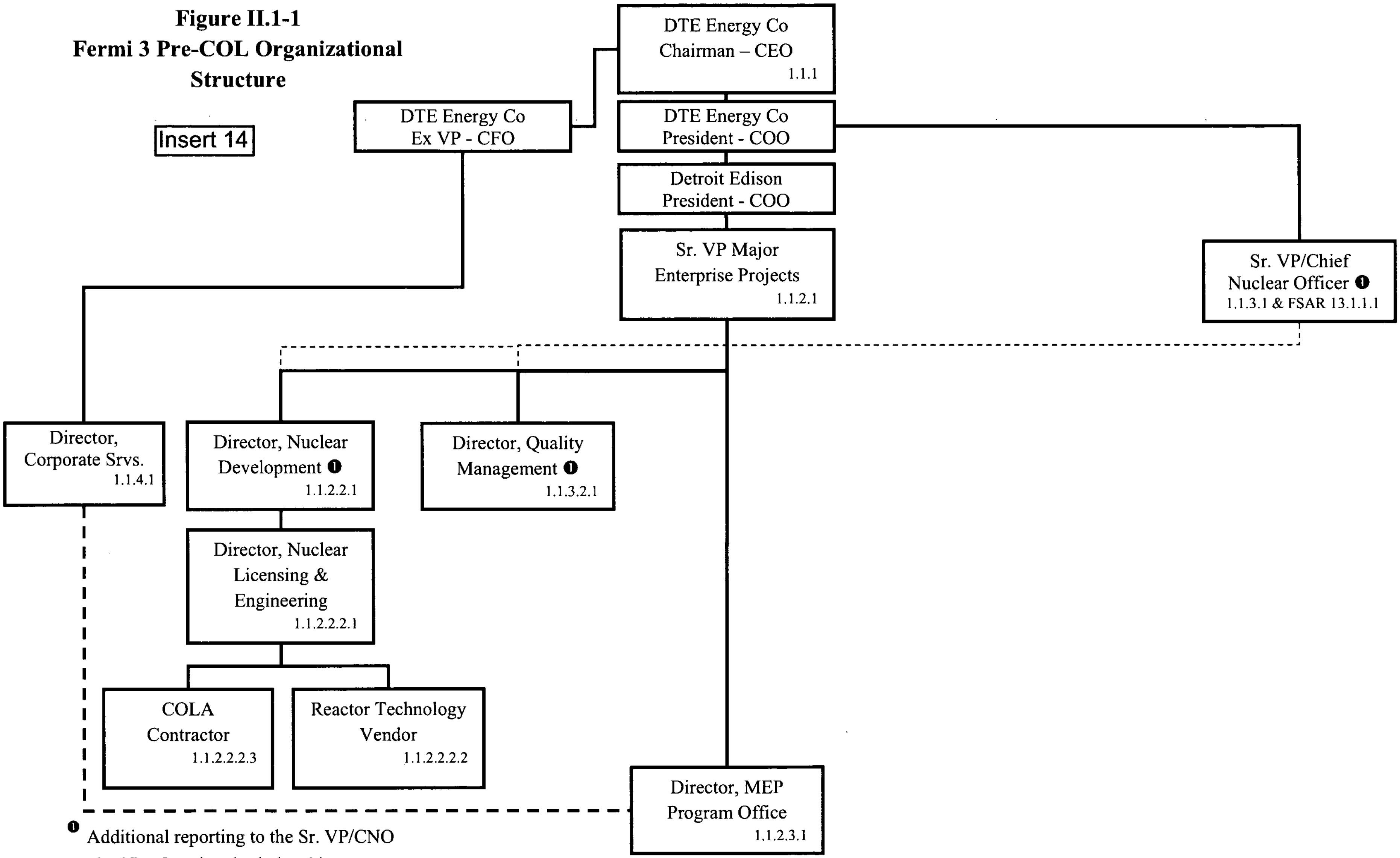
[1] Includes plant chemistry (13.1.2.1.1.13)

(dotted box) Indicates organizations that, although separate, share resources with Fermi 2 but a single management organization provides oversight for Fermi 3

Applicable section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR Chapter 13 sections; all other numbers represent QAPD sections.

Figure II.1-1
Fermi 3 Pre-COL Organizational Structure

Insert 14



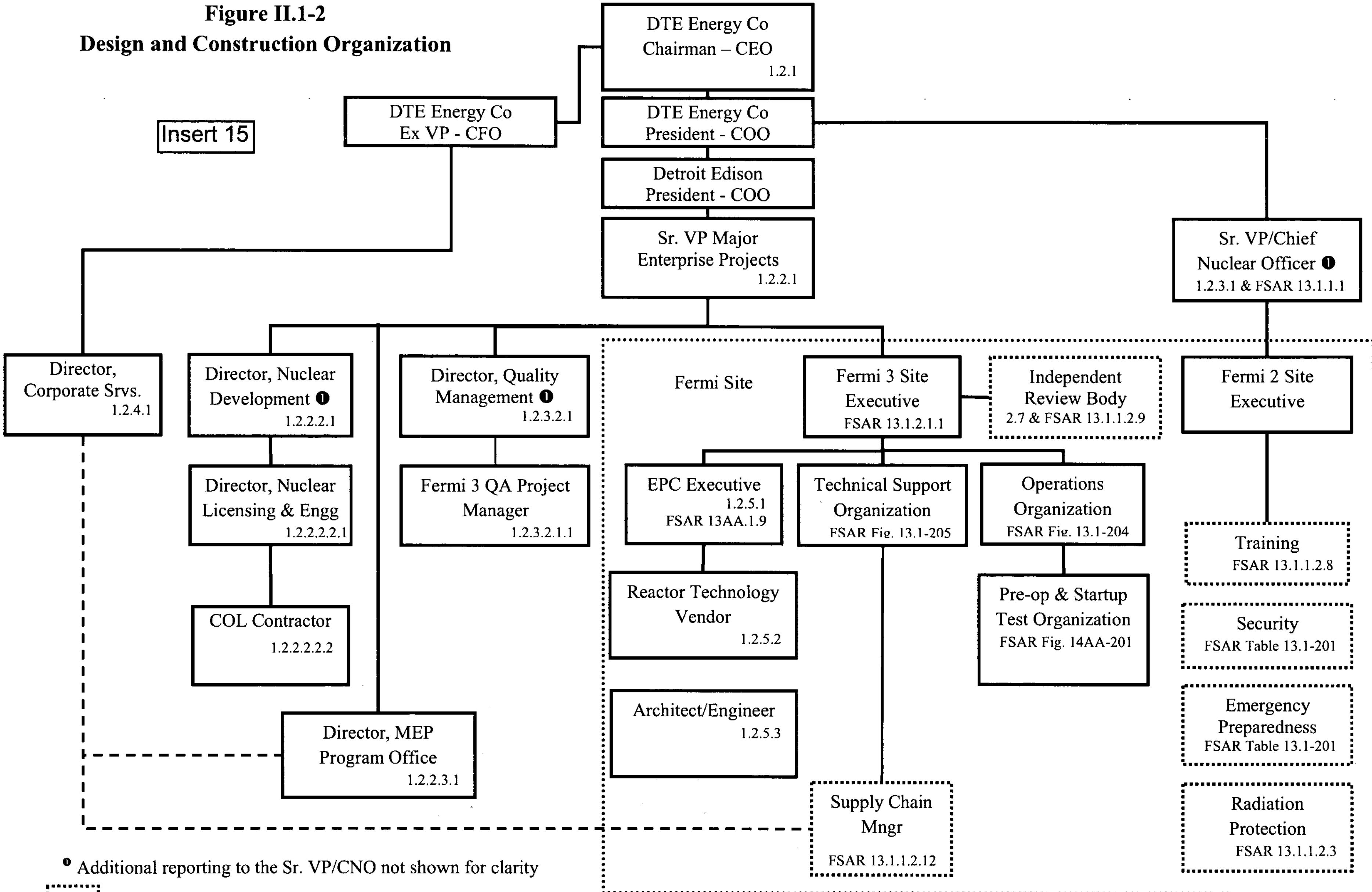
❶ Additional reporting to the Sr. VP/CNO

- - - Signifies functional relationship

Applicable QAPD section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR indicated cross reference to Chapter 13 section or figure

Figure II.1-2
Design and Construction Organization

Insert 15



❶ Additional reporting to the Sr. VP/CNO not shown for clarity

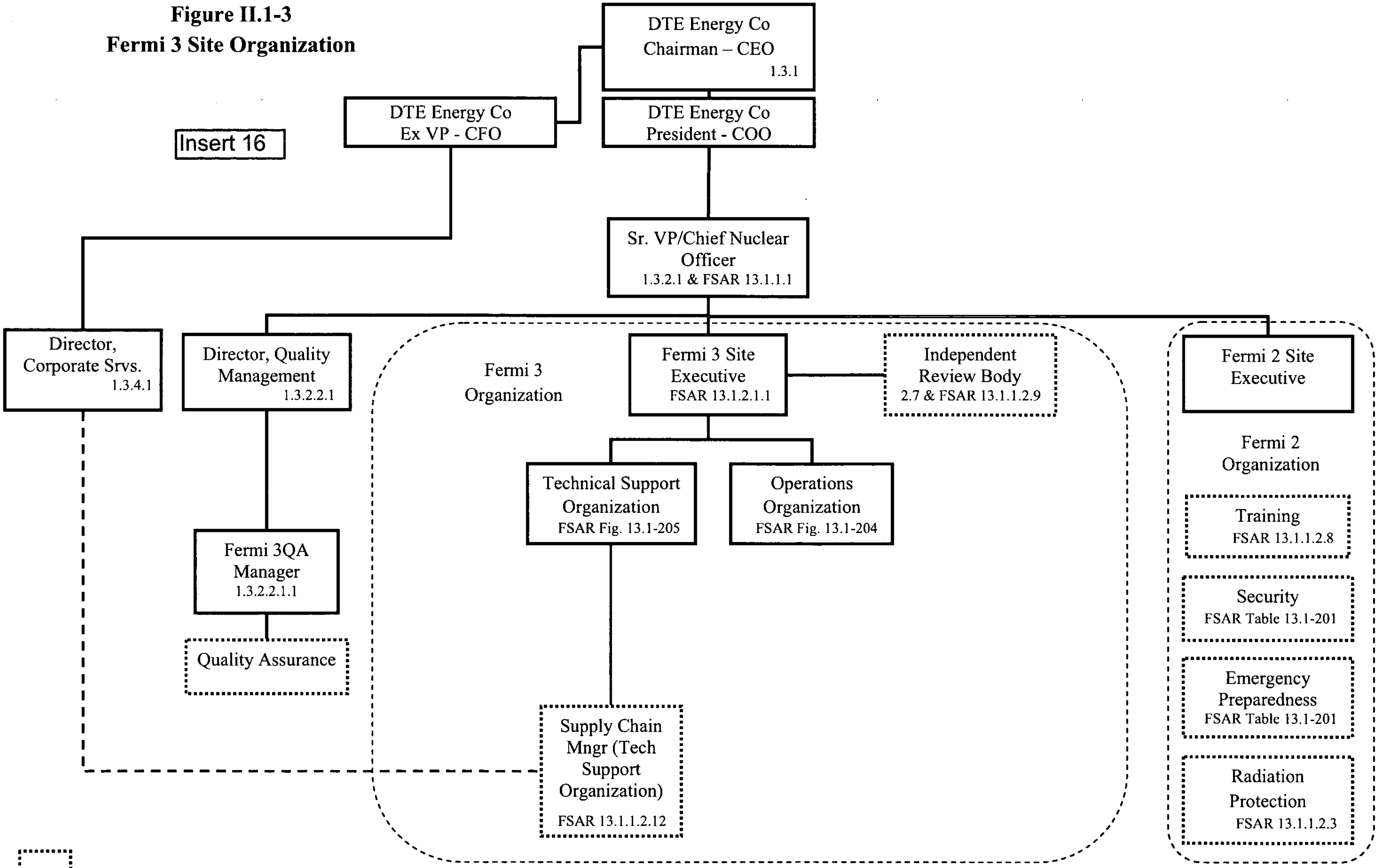
[dotted box] Indicates organizations that, although separate, share resources with Fermi 2 but a single management organization provides oversight for Fermi 3

– – Signifies functional relationship

Applicable QAPD section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR indicated cross reference to Chapter 13 section or figure

Figure II.1-3
Fermi 3 Site Organization

Insert 16



Indicates organizations that, although separate, share resources with Fermi 2 but a single management organization provides oversight for Fermi 3

Signifies functional relationship

Applicable QAPD section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR indicated cross reference to Chapter 13 section or figure

Attachment 10
NRC3-10-0016

Response to RAI Letter No. 25
(eRAI Tracking No. 4379)

RAI Question No. 17.5-12

NRC RAI 17.5-12

SRP Section 17.5 part II, subsection A, "Organization," states that the applicant's QAPD should 1) contain an organizational description that addresses the organizational structure, functional responsibilities, levels of authority, and interfaces, 2) include the onsite and offsite organizational elements that function under the cognizance of the QA program, 3) define the interface responsibilities for multiple organizations.

The NRC endorsed Nuclear Energy Institute (NEI) QAPD template (NEI 06-14, Revision 7, "Quality Assurance Program Description") as a method for providing a QAPD that meets the requirements of 10 CFR Part 50, Appendix B.

Attachment 6 to NRC3-09-0027, "Detroit Edison Company Response to NRC RAI Letter No. 10," dated September 30, 2009, states FSAR Appendix 17AA, Part II, Section 1, Fermi 3 QAPD "Organization" will be revised to reflect NEI 06-14, Revision 7.

Proposed changes to the Fermi 3 QAPD (FSAR Appendix 17AA) Part II, Section 1, provided as part of Insert 1 of Attachment 5 to NRC3-09-0027, "Detroit Edison Company Response to NRC RAI Letter No.10," dated September 30, 2009, provides an organizational numbering system ranging from three numbers (i.e., CEO 1.1.1) to seven digits (i.e., Fermi 3 QA Project Manager 1.2.4.2.1.1.1). Organizational descriptions typically contain one less digit than the positions described within the organization (i.e. QA organization is described in 1.1.3.1 and the QA Director is described 1.1.3.1.1).

Please ensure numerical consistency with the organization and position descriptions in the text and organizational charts for the pre-COL, design and construction, and operational organizations. Confusing examples include (but are not all inclusive): 1) Senior VP/CNO (1.2.4) and Senior VP MEP (1.2.2.1) are both senior VPs, but have different numbering; 2) MEP – Nuclear Development is described in 1.2.2, yet the Senior VP, MEP (1.2.2.1) seem to have more than nuclear responsibilities; and 3) the Director, Nuclear Development is coded as 1.1.2.2 in the text, yet is coded as 1.1.2.2.1 in the organizational chart.

Note: This RAI is supplemental to RAI 17.5-5 and RAI 17.5-6 included in NRC RAI Letter No. 10, dated August 12, 2009.

Supplemental Response

The organizational numbering system has been revised and the presentation order for some organizations has been moved to better ensure numerical consistency on the proposed markup. Additionally, the section pointers on the organizational charts have been revised as shown on the attached markup.

Proposed COLA Revision

The Fermi 3 Quality Assurance Program Description (QAPD) presented in Appendix 17AA is being revised as shown in the attached markup. The markup also shows the changes to Appendix 17AA resulting from the preparation of the response to the other QA related RAIs in this letter.

Markup of Detroit Edison COLA
(following 29 page(s))

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

DTE Energy®

Detroit Edison

Enrico Fermi, Unit 3

Program Description

Title: Quality Assurance Program Description

EF3 QAPD	Revision Number	
	3	

Revision Summary

~~New Document~~

~~Defines the quality assurance measures to be applied for activities related to design, construction, and operations of an ESBWR at the Fermi 3 site. Incorporates the text from NEI 06-14A, Rev 4 template with Detroit Edison specific information added where appropriate.~~

Revision 3, ...

Reviewed By / Date	Approved By / Date
Director, Quality Management	Senior Vice President, Major Enterprise Projects

Detroit Edison Company Fermi 3 Policy

Quality Assurance During Construction and Operation

Detroit Edison Company shall design, procure, construct and operate the Enrico Fermi Nuclear Station, Unit 3 (Fermi 3) nuclear plant in a manner that will ensure the health and safety of the public and workers. These activities shall be performed in compliance with the requirements of the Code of Federal Regulations (CFR), the applicable Nuclear Regulatory Commission (NRC) Facility Operating Licenses, and applicable laws and regulations of the state and local governments.

Insert 1

The Fermi 3 ESBWR Quality Assurance Program (QAP) is the Quality Assurance Program Description (QAPD) provided in this document and the associated implementing documents. Together they provide for control of Fermi 3 activities that affect the quality of safety-related nuclear plant structures, systems, and components and include all planned and systematic activities necessary to provide adequate confidence that such structures, systems, and components will perform satisfactorily in service. The QAPD may also be applied to certain equipment and activities that are not safety-related, but support safe plant operations, or where other NRC guidance establishes program requirements

The QAPD is the top-level policy document that establishes the manner in which the quality is to be achieved and presents Fermi 3's overall philosophy regarding achievement and assurance of quality. Implementing documents assign more detailed responsibilities and requirements and define the organizational interfaces involved in conducting activities within the scope of the QAP. Compliance with the QAPD and implementing documents is mandatory for personnel directly or indirectly associated with implementation of the Femi 3 QAP.

Insert 1

Detroit Edison (DECO) shall design, procure, construct and operate Fermi 3 in a manner that will ensure the health and safety of the public and workers. These activities shall be performed in compliance with the requirements of the Code of Federal Regulations (CFR), the applicable Nuclear Regulatory Commission (NRC) Facility Operating Licenses, and applicable laws and regulations of the state and local governments.

The Detroit Edison Fermi 3 Quality Assurance Program (QAP) is the Quality Assurance Program Description (QAPD) provided in this document and the associated implementing documents. Together they provide for control of Fermi 3 activities that affect the quality of safety-related nuclear plant structures, systems, and components (SSCs) and include all planned and systematic activities necessary to provide adequate confidence that such SSCs will perform satisfactorily in services. The QAPD may also be applied to certain equipment and activities that are not safety-related but support safe plant operations, or where other NRC guidance establishes program requirements.

The QAPD is the top-level policy document that establishes the manner in which quality is to be achieved and presents Fermi 3's overall philosophy regarding achievement and assurance of quality. Implementing documents assign more detailed responsibilities and requirements and define the organizational interfaces involved in conducting activities within the scope of the QAPD. Compliance with the QAPD and implementing documents is mandatory for personnel directly or indirectly associated with implementation of the Fermi 3 QAP.

__________________________ / __________________

Roy May **Date**
Senior Vice President,
Major Enterprise Projects

PART II QAPD DETAILS

SECTION 1 ORGANIZATION

This section describes the Fermi 3 organizational structure, functional responsibilities, levels of authority and interfaces for establishing, executing, and verifying QAPD implementation. The organizational structure includes corporate support and on-site functions for Fermi 3 including interface responsibilities for multiple organizations that perform quality-related functions. Implementing documents assign more specific responsibilities and duties, and define the organizational interfaces involved in conducting activities and duties within the scope of the QAPD. Management gives careful consideration to the timing, extent, and effects of organizational structure changes.

Major Enterprise Projects (MEP), specifically the Nuclear Development (ND) organization ~~is~~, responsible for new nuclear plant licensing, engineering, procurement, construction, startup and operations development activities. During these phases, several organizations within Detroit Edison implement and support the QAPD. These organizations include, but are not limited to ~~Major Enterprise Projects (~~MEP~~)~~, MEP Program Office, and Corporate Services.

Design, engineering and environmental services may be provided to the Fermi 3 ~~Nuclear Development~~ organization by suppliers in accordance with their 10 CFR 50 Appendix B/NQA-1 QAPDs, as established contractually to assure that applicable regulatory requirements ~~to assure~~ are satisfied and that Detroit Edison's responsibility to ensure adequate quality assurance under 10 CFR 50 Appendix B, Criterion I is satisfied.

The Fermi 3 Site organization is responsible for operational activities. During operations, the corporate services organization within Detroit Edison also implements and supports the QAPD.

~~Design, engineering and environmental services may be provided to the Fermi 3 Operations organization by suppliers in accordance with their 10 CFR 50 Appendix B/NQA-1 QAPDs, as established contractually to assure that applicable regulatory requirements to assure adequate quality.~~

The following sections describe the reporting relationships, functional responsibilities and authorities for organizations implementing and supporting the Fermi 3 ~~Nuclear Development~~ QA Program. The Fermi 3 Pre-COL ~~Nuclear Development~~ organization, the Fermi 3 Design and Construction organization, and the Fermi 3 Site organization are shown in QAPD Figure II.1-1, Figure II.1-2, and Figure II.1-3 respectively.

1.1 Fermi 3 Pre-COL Organization

This section describes the organizational structure for the COL application activities of Fermi 3 and the Fermi 3 Pre-COL organizational structure is shown in Figure II.1-1.

Chief Nuclear Officer (CNO)

Chief Executive Officer (CEO)

Senior

1.1.1 **Chairman and CEO**

The DTE Energy Chairman/CEO is responsible for all aspects of design, construction and operation of Detroit Edison's nuclear plants. The Chairman/CEO is also responsible for all technical and administrative support activities provided by Detroit Edison and contractors. The Chairman/CEO directs the Senior Vice President Major Enterprise Projects and the Sr. Vice President/CNO in fulfillment of their responsibilities. The Chairman/CEO reports to the DTE Energy Company Board of Directors with respect to all matters.

1.1.2 **Major Enterprise Projects – Nuclear Development**

The Major Enterprise Projects (MEP) organization, specifically Nuclear Development, is responsible for new nuclear plant licensing, engineering, procurement, construction, startup and operational development activities necessary to deliver new nuclear generating capacity to the Sr. Vice President/CNO. Nuclear Development will facilitate organizational transitions between Fermi 3 project phases. Nuclear Development is responsible for controlling interfaces between the operating units and any preconstruction or construction activities.

from pre-COL

including startup and initial testing

1.1.2.1 **Senior Vice President, MEP**

The Senior Vice President MEP (Sr. VP/MEP) ultimately reports to the DTE Energy Chairman / CEO and is responsible for the administration of the Fermi 3 QAPD. The Sr. VP MEP also directs the planning and development of the Nuclear Development staff and organization resources as well as the initial Fermi 3 staff and organization resources. The Sr. VP MEP is responsible to size the Fermi 3 Quality Assurance organization commensurate with the duties and responsibilities assigned through construction. The Sr. VP MEP is also responsible for establishing and managing contracts for the development of new nuclear generation. The Sr. VP MEP shall transition the Nuclear Development organization through the Pre-COL / Design and Construction / Operations responsibilities described in the QAPD, as those Fermi 3 activities commence.

insert 2

, including management of the corrective action and non-conformance process

1.1.2.2 .1 **Director, Nuclear Development**

3

The Director, Nuclear Development reports to the Sr. VP MEP and to the CNO and is responsible for the implementation of quality assurance requirements in the areas specified by the QAPD. For the purposes of this program, the description of the duties of the Director Nuclear Development and the Nuclear Development staff will be limited to those activities that support the Fermi COL application development.

,

1.1.2.2.2 **Nuclear Development, Nuclear Licensing and Engineering**

The Nuclear Development Licensing and Engineering (NDLE) organization is responsible for support of the Nuclear Development organization by providing engineering, licensing and document control support where applicable.

Insert 2

1.1.2.2 Nuclear Development

Nuclear Development is responsible for new nuclear plant licensing, engineering and procurement, construction, startup and operational development activities necessary to deliver new nuclear generating capacity. Nuclear Development will facilitate organizational transitions between Fermi 3 project phases. Nuclear Development is responsible for controlling interfaces between the operating units and any preconstruction or construction activities.

The reactor technology vendor, identified in FSAR Subsection 1.4.2, reports to the Director, Nuclear Licensing and Engineering and

,

1.1.2.2.2.1 **Director, Nuclear Licensing and Engineering**

The Director, Nuclear Licensing and Engineering reports to the Director Nuclear Development and is responsible for the administration of engineering and nuclear licensing for Fermi 3 under the QAPD.

1.1.2.2.2.2 ~~**NSSS**~~ Reactor Technology Vendor

~~The Nuclear Steam Supply System (NSSS) vendor~~ supports the COL application through the review and subsequent approval of the Design Certification application for the selected standard design. A QAPD submitted by the Design Certification application covering design QA activities in support of the COL application would be implemented under the QAPD submitted by the NSSS vendor and reviewed and approved by the NRC as part of the Design Certification reviews.

, identified in FSAR Subsection 1.4.3, reports to the Director, Nuclear Licensing and Engineering and

1.1.2.2.2.3 **COLA Contractor**

The COLA Contractor provides engineering services for the development of the COL application. These engineering services include site-specific license engineering, and design activities necessary to support development of the COL application in accordance with the COLA Contractor's 10 CFR 50 Appendix B/NQA-1 QAPD, as established contractually to assure that applicable regulatory requirements necessary to assure adequate quality are satisfied. The COLA Contractor also provides engineering services in planning and support for preconstruction activities for Fermi 3.

1.1.2.3 **MEP Program Office**

The MEP Program Office is responsible for supporting the Nuclear Development organization through performing activities related to procurement, budget, planning, etc. where applicable.

1.1.2.3.1 **Director, MEP Program Office**

The Director, MEP Program Office reports to the Sr. VP MEP and is responsible for managing the MEP support functions for Nuclear Development activities in accordance with the QAPD.

Insert 3

1.1.3.1 **Senior Vice President / Chief Nuclear Officer**

The Senior Vice President/Chief Nuclear Officer (CNO) ultimately reports to the Chairman / CEO and is responsible for the overall administration of Detroit Edison nuclear plants. The CNO is the ultimate management authority for establishing QA policy and responsibility for the QA function. The CNO will support Nuclear Development activities through the Director, Nuclear Development and the Director, Quality Management.

1.1.3.2 **Quality Assurance**

The Quality Assurance organization is responsible for independently planning and performing activities to verify the development and effective implementation of the Fermi 3 QAPD including

Insert 3

1.1.3 Nuclear Operations

Nuclear Operations is responsible for Detroit Edison's nuclear units: Fermi 1, Fermi 2 and Fermi 3.

for administering the Auditor and Lead Auditor Certification process;

Insert 4

but not limited to Nuclear Development, engineering, licensing, document control, corrective action program and procurement that support preconstruction activities for Fermi 3. The QA organization reports to the Director, Quality Management.

1.1.3.2.1 Director, Quality Management

The Director, Quality Management (DQM) reports to the CNO and to the Sr. VP MEP for Fermi 3 activities and is responsible for developing and maintaining the Fermi 3 QAPD, evaluating compliance to the program and managing the QA organization resources. The DQM is responsible for developing and verification of implementation of the QAPD described in this document. The DQM is responsible for assuring compliance with regulatory requirements and procedures through audits and technical reviews; for monitoring organization processes to ensure conformance to commitments and licensing document requirements; for ensuring that vendors providing quality services, parts and materials to Fermi 3 are meeting the requirements of 10 CFR 50, Appendix B through Nuclear Procurement Issues Committee (NUPIC) or Detroit Edison vendor audits. The DQM has sufficient independence from other Nuclear Development priorities to bring forward issues affecting safety and quality and makes judgments regarding quality in all areas necessary regarding Fermi 3's Nuclear Development activities. The DQM may make recommendations to Fermi 3 management regarding improving the quality of work processes. If the DQM disagrees with any actions taken by the Nuclear Development organization and is unable to obtain resolution, the DQM shall bring the matter to the attention of the CNO who will determine the fi

for performing QA technical reviews of procurement documents, acceptance of contractor QA programs, and oversight of contractor QA program implementation; and

1.1.4 **Corporate Services**

and

The Corporate Services organization is responsible for supporting the Nuclear Development organization ~~through~~ performing activities related to procurement, contract ~~management~~, business performance~~,~~ records management, logistics, etc. ~~where applicable~~.

. Corporate Services also supports Nuclear Development and the MEP Program Office by providing

1.1.4.1 **Director, Corporate Services**

The Director, Corporate Services reports to the DTE Energy Executive Vice President and CFO and is responsible for managing the overall Corporate Services organization including assuring that Supply Chain Management, Financial and Operational Performance, and Materials and Logistics support for Nuclear Development activities ~~in accordance with the QAPD.~~

and the MEP Program Office by

1.1.5 Authority to Stop Work

Quality assurance and inspection personnel have the authority, and the responsibility, to stop work in progress which is not being performed in accordance with approved procedures or where safety or SSC integrity may be jeopardized. This extends to off-site work performed by suppliers that furnish safety-related materials and services to Fermi 3.

1.1.6 Quality Assurance Organizational Independence

Insert 4

The QA organization's function includes:

- Coordinating the development of audit schedules,
- Auditing, performing surveillances, and evaluating suppliers of quality services, and
- Supporting general QA indoctrination and training for Detroit Edison personnel performing activities covered by the QAPD.
- Quality Control

For COL application activities, independence shall be maintained between the organization or organizations performing the checking (quality assurance and control) functions and the organizations performing the functions. This provision is not applicable to design review/verification.

1.1.7 NQA-1-1994 Commitment

In establishing its organizational structure, Detroit Edison, Fermi 3 commits to compliance with NQA-1-1994, Basic Requirement 1 and Supplement 1S-1.

1.2 Fermi 3 Design and Construction Organization

This section describes the organizational structure through the design and construction phase of the Fermi 3 project. It is anticipated that even after fuel load, construction activities will be ongoing. Those positions required to support these activities will retain their applicable construction / preoperational responsibilities until it is deemed that they are no longer necessary. As the construction of systems, structures, and components (SSC), or portions thereof is completed, control and authority (including oversight, configuration and operations) is transferred from the contractor to the cognizant owner departments in the operations phase fully described in Section 1.3. During the transition, responsibilities will be clearly defined in instructions and procedures to ensure appropriate control is maintained over each SSC. The Fermi 3 Design and Construction organization is represented in Figure II.1-2.

1.2.1 Chairman and CEO

The ~~DTE Energy~~ Chairman/CEO is responsible for all aspects of design, construction and operation of Detroit Edison's nuclear plants as described in Section 1.1.1 S

1.2.2 Major Enterprise Projects ~~— Nuclear Development~~

The Major Enterprises Project (MEP) organization, specifically Nuclear Development, is responsible for new nuclear plant licensing, engineering, procurement, construction, startup and operational development activities necessary to deliver new nuclear generating capacity to the ~~Sr. Vice President/~~CNO. ~~Nuclear Development will facilitate organizational transitions between the Fermi 3 Pre-COL, Design and Construction, and Operations phases. Nuclear Development is responsible for controlling interfaces between the operating units and any preconstruction or construction activities.~~

1.2.2.1 Senior Vice President, MEP

The Sr. VP MEP ultimately reports to the ~~DTE Energy~~ Chairman / CEO and is responsible for the administration of the Fermi 3 QAPD. The Sr. VP MEP also directs the planning and development of the Nuclear Development staff and organization resources as well as the initial Fermi 3 staff and organization resources. The Sr. VP MEP is responsible to size the Fermi 3 Quality Assurance organization commensurate with the duties and responsibilities assigned

MEP

through construction. The Sr. VP MEP is also responsible for establishing and managing contracts for the development of new nuclear generation. The Sr. VP MEP shall transition the ~~Nuclear Development~~ organization through the Pre-COL / Design and Construction / Operations responsibilities described in the QAPD, as those Fermi 3 activities commence.

Insert 5

,

1.2.2.2.1 Director, Nuclear Development

The Director, Nuclear Development reports to the Sr. VP MEP and to the CNO and is responsible for the implementation of quality assurance requirements in the areas specified by the QAPD. For the purposes of this program, the description of the duties of the Director Nuclear Development and the Nuclear Development staff will be limited to those activities that support the Fermi 3 Design and Construction activities.

1.2.2.2.2 Nuclear Development, Nuclear Licensing and Engineering

The Nuclear Development Licensing and Engineering (NDLE) organization is responsible for support of the Nuclear Development organization by providing engineering, licensing and document control support where applicable.

, including management of the corrective action and non-conformance process

1.2.2.2.2.1 Director, Nuclear Licensing and Engineering

The Director, Nuclear Licensing and Engineering reports to the Director Nuclear Development and is responsible for the administration of engineering, nuclear fuel and nuclear ~~licensing~~ and support activities for Fermi 3 under the QAPD.

,

, identified in FSAR Subsection 1.4.3, reports to the Director, Nuclear Licensing and Engineering and

1.2.2.2.2.2 COL Contractor

The COL Contractor provides engineering services in support of licensing activities necessary to support updates, changes, etc. to the COL. These engineering services include site-specific license engineering, and design activities necessary to support development of proposed COL updates, changes etc., and planning and support for preconstruction and construction of Fermi 3.

1.2.2.3 MEP Program Office

The MEP Program Office is responsible for supporting the Nuclear Development organization through performing activities related to procurement, budget, planning, etc. where applicable.

1.2.2.3.1 Director, MEP Program Office

The Director, MEP Program Office reports to the Sr. VP MEP and is responsible for managing the MEP support functions for Nuclear Development activities in accordance with the QAPD.

~~**1.2.3 Corporate Services**~~

~~The Corporate Services organization is responsible for supporting the Nuclear Development organization through performing activities related to procurement, contract management, business performance, records management, logistics, etc., where applicable.~~

Insert 5

The Sr. VP MEP is also responsible for developing and implementing a plan for transition of the site organization from the construction phase to the operating phase. The plan shall be fully implemented and transition completed prior to commencement of commercial operations. Once the transition is complete, operational responsibility for Fermi 3 will be with the CNO and under the direction of the site executive (see FSAR Subsection 13AA.2.4).

As the construction of systems, or portions thereof, are completed, control and authority, including oversight, configuration and operations, is transferred from the contractor to the cognizant department in the site organization (see FSAR Subsection 13AA.2).

During the transition, responsibilities will be clearly defined in instructions and procedures to ensure appropriate authority is maintained for each system, structure and component.

It is anticipated that even after fuel load, construction activities will be ongoing. Those positions required to support these activities will retain their applicable construction or preoperational responsibilities until it is deemed that they are no longer necessary.

1.2.2.2 Nuclear Development

Nuclear Development is responsible for new nuclear plant licensing, engineering and procurement, construction, startup and operational development activities necessary to deliver new nuclear generating capacity. Nuclear Development will facilitate organizational transitions between Fermi 3 project phases. Nuclear Development is responsible for controlling interfaces between the operating units and any preconstruction or construction activities.

consists of the operating organization (see FSAR Subsection 13.1.2) lead by the site executive, the Management and Technical Support Organization (see FSAR Subsection 13.1.1), and during construction includes the Preoperational and Startup Testing organization (see FSAR Subsection 13AA.2.2) reporting to the plant manager. The site organization

~~1.2.3.1 **Director, Corporate Services**~~

~~The Director, Corporate Services reports to the DTE Energy Executive Vice President and CFO and is responsible for managing the overall Corporate Services organization including assuring that Supply Chain Management, Financial and Operational Performance, and Materials and Logistics support for Nuclear Development activities in accordance with the QAPD.~~

Insert 6

1.2.3.1 **Senior Vice President / CNO**

The Senior Vice President/CNO ultimately reports to the Chairman / CEO and is responsible for the overall administration of Detroit Edison nuclear plants as described in Section 1.3.2.1

1.2.3.2 **Quality Assurance**

The Fermi 3 Quality Assurance Organization is responsible for independently planning and performing activities to verify the development and effective implementation of the Fermi 3 QAPD as described in Section 1.3.2.2

1.2.3.2.1 **Director, Quality Management**

The DQM is responsible for developing and maintaining the Fermi 3 QAPD from COL through to and including operations as described in Section 1.3.2.2.1

1.2.3.2.1.1 **Fermi 3 Quality Assurance Project Manager**

The Fermi 3 Quality Assurance Project Manager (QAPM) reports to the DQM and is responsible for the development and verification of implementation of the QAPD described in this document. The QAPM is responsible for assuring compliance with regulatory requirements and procedures through audits and technical reviews; ~~for~~ monitoring organization processes to ensure conformance to commitments and licensing document requirements; ~~for~~ ensuring that vendors providing quality services, parts and materials to Fermi 3 are meeting the requirements of 10 CFR 50, Appendix B through Nuclear Procurement Issues Committee (NUPIC) or Detroit Edison vendor audits. The QAPM has sufficient independence from other Fermi 3 priorities to bring forward issues affecting safety and quality and makes judgments regarding quality in all areas necessary regarding Fermi 3 activities. The QAPM may make recommendations to Fermi 3 management regarding improving the quality of work processes. If the QAPM disagrees with any actions taken by the Fermi 3 organization and is unable to obtain resolution, the QAPM shall inform the DQM who will bring the matter to the attention of the CNO to determine the final disposition. As the QA organization transitions from design and construction to operations (i.e. the project phase ends), the QAPM becomes the Fermi 3 Quality Assurance Manager described in Section 1.3.2.1.1.1.

Insert 7

1.2.3.3 **Site Organization**

The Fermi 3 site organization executes all activities for operations, maintenance, security, training, pre-operational testing, startup testing, emergency planning, etc. of the Fermi 3

Insert 8 and "The QAPM..." to begin a new paragraph.

Insert 6

1.2.3 Nuclear Operations
Nuclear Operations is responsible for Detroit Edison's nuclear units: Fermi 1, Fermi 2 and Fermi 3.

Insert 7

QA technical reviews of procurement documents, acceptance of contractor QA programs, oversight of contractor's QA program implementation, oversight of the quality of design and construction, management of the training and qualification program for Inspection and Test personnel, and

Insert 8

The Fermi 3 Quality Assurance Project Manager is responsible for the following during startup and testing operations:

- Quality Assurance support of the Preoperational and Startup Testing organization (see FSAR Subsection 13AA.2.2)
- Oversight of startup activities
- QA selected reviews and oversight of programs developed for operations including, but not limited to, the identification of QA Level I systems, structures or components, and any changes thereto, their performance, and verifying and maintaining the facility design basis
- QA selected reviews and oversight of operations, including maintenance, testing and modification procedures
- Review and concurrence of changes to the identified QA Level I items that could affect their function.
- QA oversight of operating procedure implementation
- Quality Control (QC) inspection certification process
- Applicable discipline QC inspections of modifications to QA Level I components.
- QA oversight of implementation of controls for measuring and test equipment

The reactor technology vendor, indentified in FSAR Subsection 1.4.2,

systems, structures and components (SSC), or portions thereof to support transfer from the construction contractor to the cognizant owner departments as described in FSAR Appendix 13AA, Section 13AA.2.2.

Insert 9 (2 pgs)

1.2.5.2 ~~NSSS~~ Reactor Technology Vendor

~~NSSS~~ provides engineering services for plant design and licensing of Fermi 3 on the Detroit Edison site. These engineering services for Fermi 3 include site-specific engineering and design necessary to support preconstruction and construction activities associated with the nuclear steam supply system (NSSS), i.e. the certified portion of the design.

The

the remaining plant design and licensing of Fermi 3 on the Detroit Edison Site.

1.2.5.3 ~~A/E~~ Architect/Engineer (A/E)

A/E Firm provides engineering services for ~~the development of the COL application~~. These engineering services include ~~site-specific license engineering, and design activities necessary to support development of the COL application, and planning and support for preconstruction and construction activities~~ for Fermi 3.

site specific support of the reactor technology vendor, design of other support facilities not provided by the reactor technology vendor, site planning and associated activities, preconstruction planning, and construction support

1.2.6 **Authority to Stop Work**

Quality assurance and inspection work in progress which is not being performed in accordance with approved procedures or where safety or SSC integrity may be jeopardized. This extends to off-site work performed by suppliers that furnish safety-related materials and services to Fermi 3.

1.2.7 **Quality Assurance Organizational Independence**

For the Design and Construction phase, independence shall be maintained between the organization or organizations performing the checking (quality assurance and control) functions and the organizations performing the functions. This provision is not applicable to design review/verification.

1.2.8 **NQA-1-1994 Commitment**

In establishing its organizational structure, Fermi 3 commits to compliance with NQA-1-1994, Basic Requirement 1 and Supplement 1S-1.

, identified in FSAR Subsection 1.4.2.1,

1.3 **Fermi 3 Operational Organization**

This section describes the organizational structure for the operational activities of Fermi 3 and the Fermi 3 Site organizational structure is shown in Figure II.1-3.

1.3.1 **Chairman and CEO**

The Chairman/CEO is responsible for all aspects of design, construction and operation of Detroit Edison's nuclear plants as described in Section 1.1.1

Insert 10

1.3.2.1 **Senior Vice President / CNO**

Insert 9 (pg 1 of 2)

1.2.4 Corporate Services

The Corporate Services organization is responsible for supporting the Nuclear Development organization, the MEP Program Office, and the operating (see FSAR Subsection 13.1.2) and technical support (see FSAR Subsection 13.1.1) organizations through executing activities related to procurement, contract management and business performance. Corporate Services also supports Nuclear Development, the MEP Program Office and the site organization providing records management, logistics, etc. ~~where applicable~~.

1.2.4.1 Director, Corporate Services

The Director, Corporate Services reports to the DTE Energy Executive Vice President and Chief Financial Officer and is responsible for overall management of the Corporate Services organization, including ~~assuring that~~ Supply Chain Management, Financial and Operational Performance, and materials and logistic support for Nuclear Development through the MEP Program Office, and the operating (see FSAR Subsection 13.1.2) through technical support (see FSAR Subsection 13.1.1) organizations ~~activities in accordance with the QAPD~~.

1.2.5 Engineering Procurement and Construction (EPC) Contractor

The EPC contractor is contracted to deliver a commissioned nuclear generating unit to Detroit Edison and includes as key elements the reactor technology vendor and the Architect/Engineer (AE) (see FSAR Appendix 13AA).

1.2.5.1 Engineering Procurement Construction Executive

The EPC Executive retains and exercises responsibility for the scope and implementation of the EPC contractor's QA program. The EPC Executive shall have sufficient authority to accomplish those parts of the overall QA program for which the EPC contractor is responsible including responsibility and authority to stop unsatisfactory work and control of further processing, delivery, installation, or use of nonconforming items. The EPC executive shall ensure that the applicable portion of the EPC contractor's or any subcontractor or vendor's QA program is properly documented, approved, and implemented (people are trained and resources are available) before any activity within the scope of the QA program is undertaken. The EPC contractor shall ensure that the size of the EPC contractor's QA organization is commensurate with its duties and responsibilities. The EPC executive may assign responsibility for ensuring effective execution for any portion of the EPC contractor's QA program but shall ensure that authority as may be necessary to perform the function is provided. The EPC contractors QA program is binding on all participating organizations, including all employees or contractors whose activities may influence quality.

The EPC contractor's QA performance shall be formally evaluated by the Fermi 3 3 Quality Assurance Project Manager.

The EPC Executive provides a single point of contact for Detroit Edison and accountable to the site executive as described in FSAR Section 13AA.1.9.

Insert 9 (pg 2 of 2)

Controls and lines of communication between the site executive and the EPC Executive shall be identified and documented. Responsibility for QA functions and the extent of oversight shall be clearly established.

Insert 10

1.3.2 Nuclear Operations

Nuclear Operations is responsible for Detroit Edison's nuclear units: Fermi 1, Fermi 2 and Fermi 3.

for administering the Auditor and Lead Auditor Certification process;

Insert 11

The Senior Vice President/CNO ultimately reports to the Chairman and CEO and is responsible for the overall administration of Detroit Edison nuclear plants. The CNO is the ultimate management authority for establishing QA policy and responsibility for the QA function. Reporting to the CNO are the Director Quality Management and the Fermi 3 Site Executive.

1.3.2.2 Quality Assurance

Insert 12

The Fermi 3 Quality Assurance Organization is responsible for independently planning and performing activities to verify the development and effective implementation of the Fermi 3 QAPD including but not limited to engineering, licensing, document control, corrective action program and procurement that support Fermi 3 operations. Personnel resources of the QA organization are shared between units. The Fermi 3 Quality Assurance Manager, ~~see 1.3.2.1.1.1,~~ oversees the QA group for the Fermi 3 site.

1.3.2.2.1 Director, Quality Management

The DQM reports to the CNO for the operations activities and is responsible for developing and maintaining the Fermi 3 QAPD, evaluating compliance to the programs and managing the QA organization resources. The DQM is responsible to size the Quality Assurance organization commensurate with the duties and responsibilities assigned during operations.

1.3.2.2.1.1 Fermi 3 Quality Assurance Manager

The Fermi 3 Quality Assurance Manager (QAM) reports to the DQM and is responsible for the development and verification of implementation of the QAPD described in this document. The QAM is responsible for assuring compliance with regulatory requirements and procedures through audits and technical reviews; for monitoring organization processes to ensure conformance to commitments and licensing document requirements; for ensuring that vendors providing quality services, parts and materials to Fermi 3 are meeting the requirements of 10 CFR 50, Appendix B through Nuclear Procurement Issues Committee (NUPIC) or Detroit Edison vendor audits. The QAM has sufficient independence from other Fermi 3 priorities to bring forward issues affecting safety and quality and makes judgments regarding quality in all areas necessary regarding Fermi 3 activities. The QAM may make recommendations to Fermi 3 management regarding improving the quality of work processes. If the QAM disagrees with any actions taken by the Fermi 3 organization and is unable to obtain resolution, the QAM shall inform the DQM who will bring the matter to the attention of the CNO to determine the final disposition.

for performing QA technical reviews of procurement documents, acceptance of contractor QA programs, and oversight of contractor QA program implementation; and

~~1.3.3 Corporate Se~~

~~The Corporate Services organization is responsible for supporting the Nuclear Development organization through performing activities related to procurement, contract management, business performance, records management, logistics, etc., where applicable.~~

Insert 11

The CNO assumes responsibility of Fermi 3 from the Sr. VP MEP after construction of the plant. The CNO becomes responsible for overall plant nuclear safety and takes the measures needed to provide acceptable performance of the staff in operating, maintaining, and providing technical support to the plant. The CNO delegates authority and responsibility for the operation and support of the site through the site executive, see FSAR Subsection13.1.2.1.1. It is the responsibility of the CNO to provide guidance and direction such that safety-related activities, including engineering, construction, operations, operations support, maintenance, and planning are performed following the guidelines of the QA program. The CNO has no ancillary responsibilities that might detract attention from nuclear safety. The CNO is responsible for appointing an Independent Review Body (IRB) chair and assuring the IRB functions as described in Part II, Subsection 2.7

Insert 12

The QA organization's function includes:

- Coordinating the development of audit schedules,
- Auditing, performing surveillances, and evaluating suppliers of quality services, and
- Supporting general QA indoctrination and training for Detroit Edison personnel performing activities covered by the QAPD.
- Quality Control

operating organization (see FSAR Subsection 13.1.2), led by the site executive (see FSAR Subsection 13.1.2.1.1) and supported by the technical support organization (see FSAR Subsection 13.1.1),

Site

1.3.3.1 **Director, Corporate Services**

The Director, Corporate Services reports to the DTE Energy Executive Vice President and CFO and is responsible for managing the overall Corporate Services organization including assuring that Supply Chain Management, Safety and Health and Information Technology support Nuclear Development activities in accordance with the QAPD.

, detailed in FSAR Subsection 13.1.2,

1.3.3 **Fermi 3 Operating Organization**

The Fermi 3 Operating Organization executes all activities for operations, maintenance, security, training, modification, outage management, procurement, engineering, emergency planning, etc. of the Fermi 3 plant site. The Fermi 3 Operating Organization is responsible for operations quality inspection activities of operations on-site work, as well as controlling interfaces between the Nuclear Development organization (for future or continuing capital projects), operating units, and any preconstruction or construction activities. Full details of the Fermi 3 Operating Organization are available in FSAR Chapter 13.

Insert 13

1.3.5 **Authority to Stop Work**

Quality assurance and inspection personnel have the authority, and the responsibility, to stop work in progress which is not being performed in accordance with approved procedures or where safety or SSC integrity may be jeopardized. This extends to off-site work performed by suppliers that furnish safety-related materials and services to Fermi 3.

1.3.6 **Quality Assurance Organizational Independence**

Independence shall be maintained between the organization or organizations performing the checking (quality assurance and control) functions and the organizations performing the functions. This provision is not applicable to design review/verification.

1.3.7 **NQA-1-1994 Commitment**

In establishing its organizational structure, Fermi 3 commits to compliance with NQA-1-1994, Basic Requirement 1 and Supplement 1S-1.

Insert 13

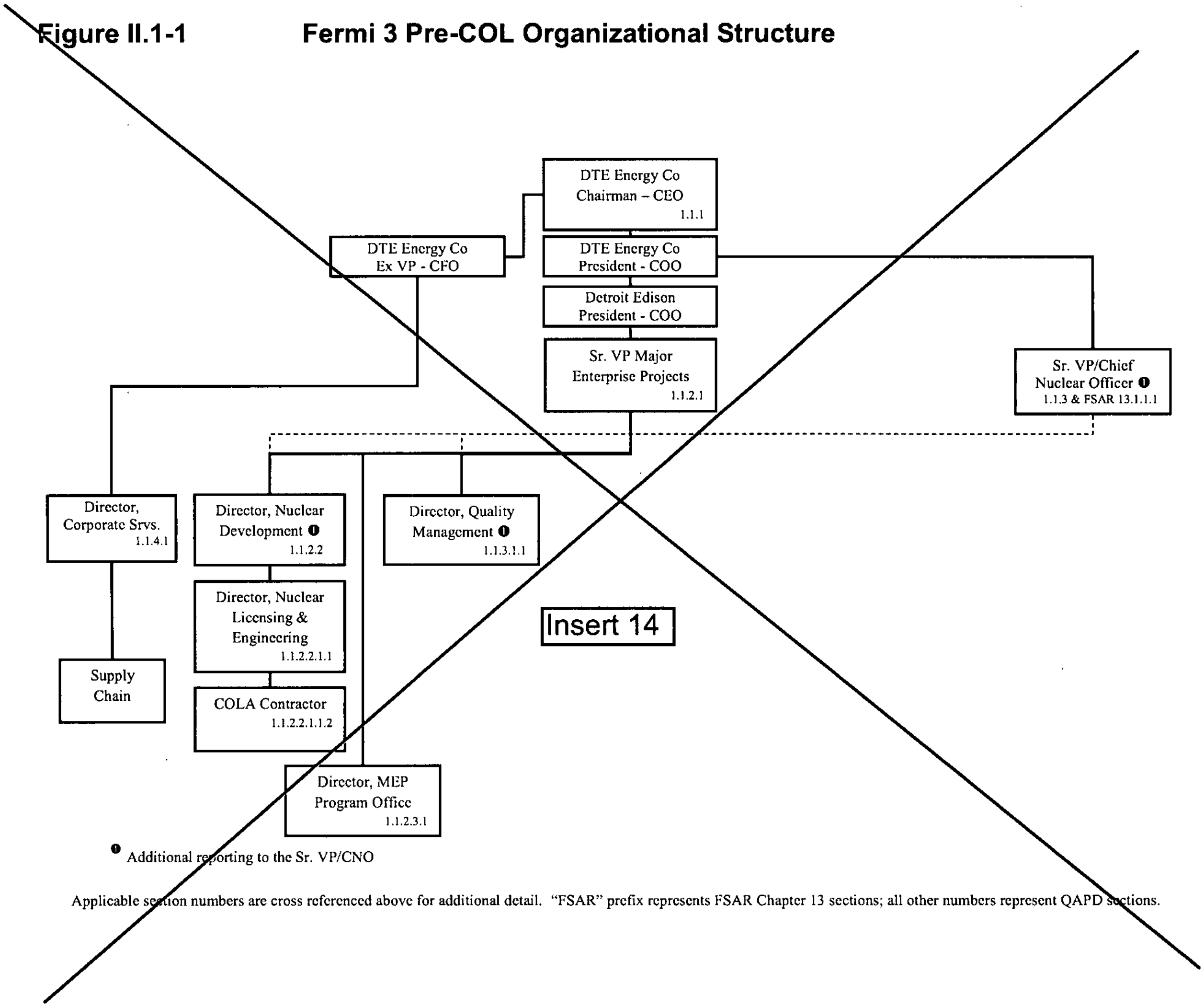
1.3.4 Corporate Services

The Corporate Services organization is responsible for supporting the Nuclear Development operating organization (see FSAR Subsection 13.1.2) and technical support organization (see FSAR Subsection 13.1.1) through executing activities related to procurement, contract management and business performance. Corporate Services also supports the site organization providing records management, logistics, etc. where applicable.

1.3.4.1 Director, Corporate Services

The Director, Corporate Services reports to the DTE Energy Executive Vice President and Chief Financial Officer and is responsible for overall management of the Corporate Services organization, including assuring that Supply Chain Management, Safety and Health, Financial and Operational Performance, and Information Technology support Nuclear Development activities, materials and logistic support to the operating organization (see FSAR Subsection 13.1.2) through the technical support organization (see FSAR Subsection 13.1.1) activities in accordance with the QAPD.

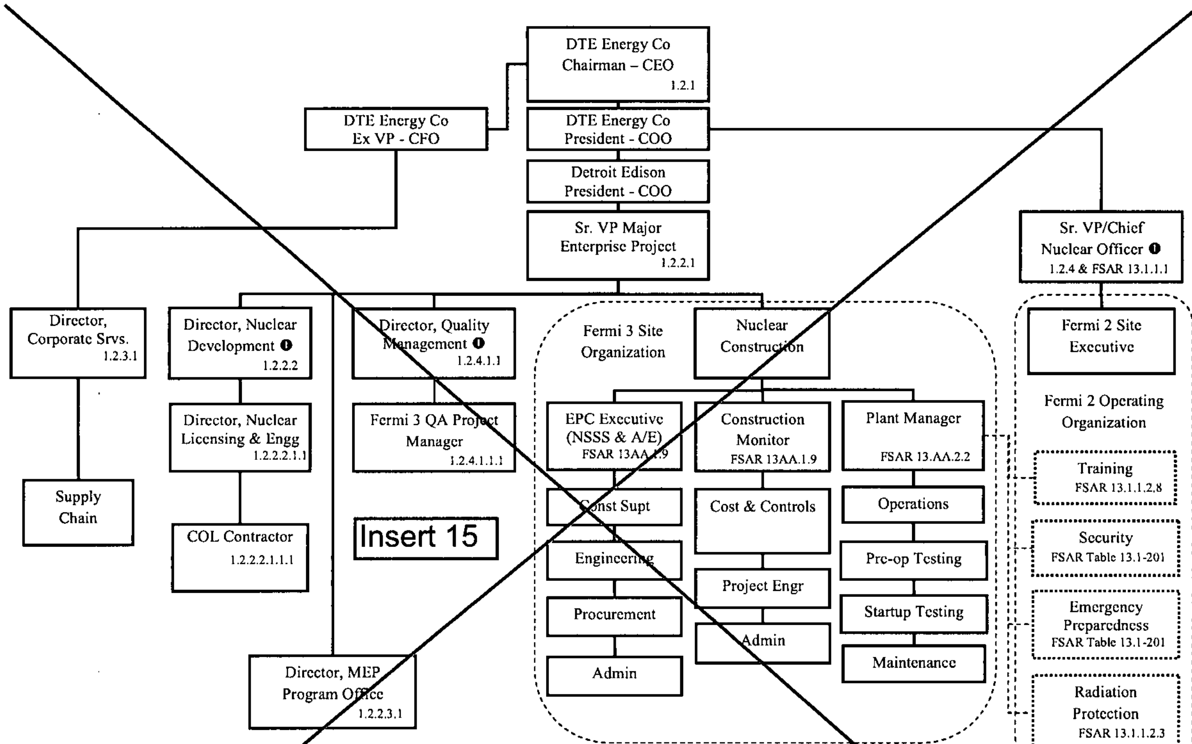
Figure II.1-1 Fermi 3 Pre-COL Organizational Structure



❶ Additional reporting to the Sr. VP/CNO

Applicable section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR Chapter 13 sections; all other numbers represent QAPD sections.

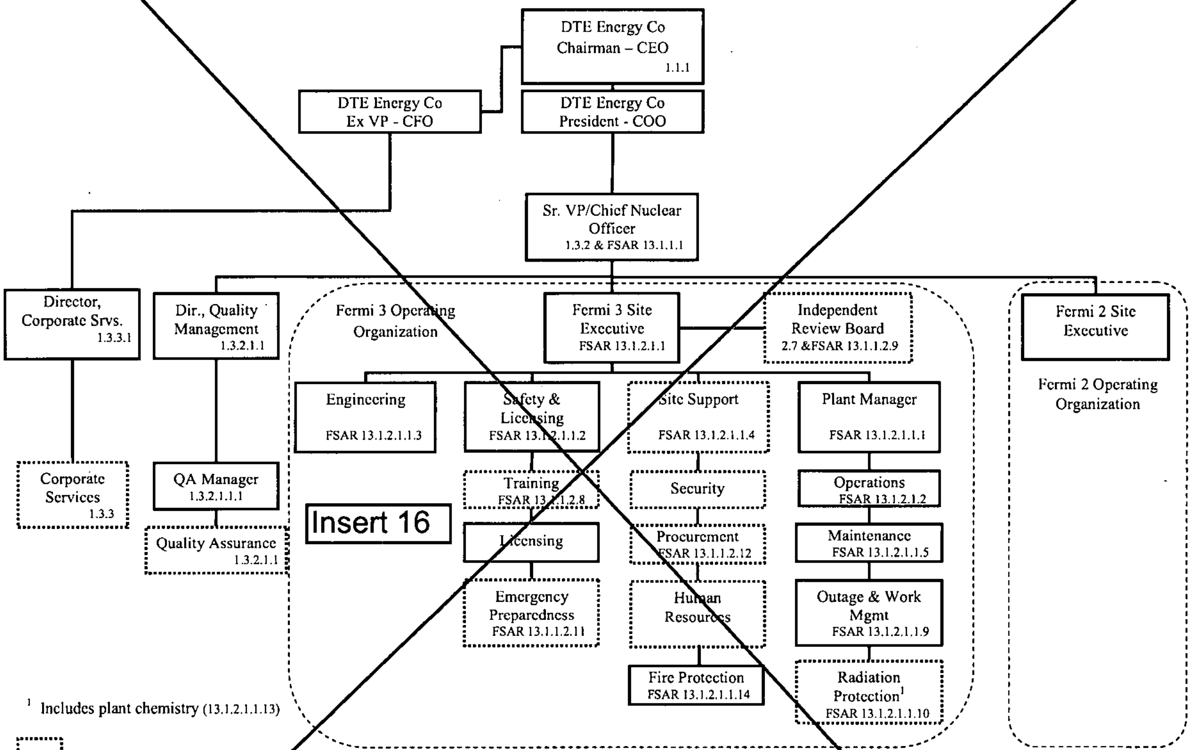
Figure II.1-2 Design and Construction Organization



❶ Additional reporting to the Sr. VP/CNO not shown for clarity

Applicable section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR Chapter 13 sections; all other numbers represent QAPD sections.

Figure II.1-3 Fermi 3 Operating Organizational Structure



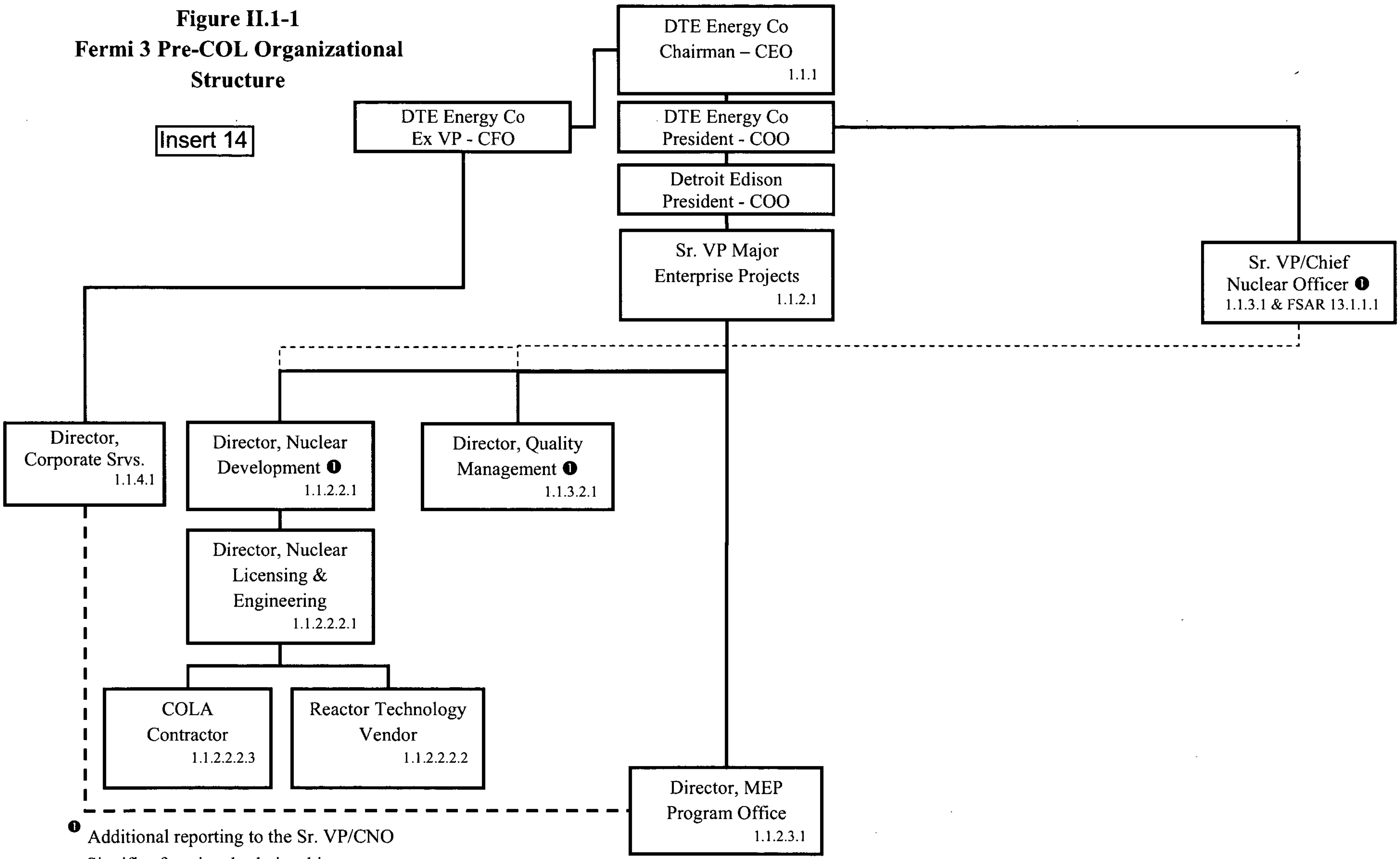
[1] Includes plant chemistry (13.1.2.1.1.13)

(dotted box) Indicates organizations that, although separate, share resources with Fermi 2 but a single management organization provides oversight for Fermi 3

Applicable section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR Chapter 13 sections; all other numbers represent QAPD sections.

Figure II.1-1
Fermi 3 Pre-COL Organizational Structure

Insert 14



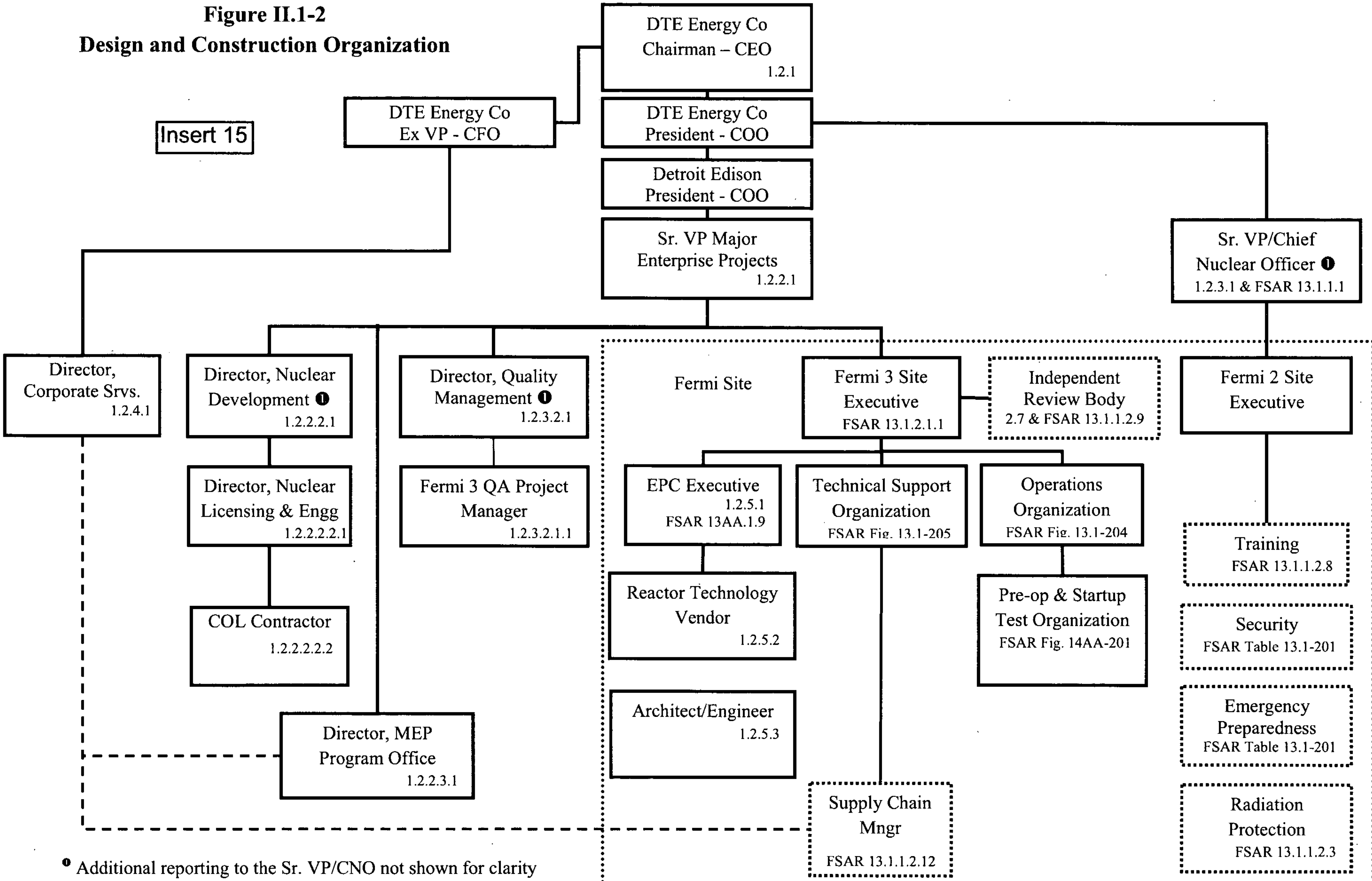
❶ Additional reporting to the Sr. VP/CNO

- - - Signifies functional relationship

Applicable QAPD section numbers are cross referenced above for additional detail. “FSAR” prefix represents FSAR indicated cross reference to Chapter 13 section or figure

Figure II.1-2
Design and Construction Organization

Insert 15



❶ Additional reporting to the Sr. VP/CNO not shown for clarity

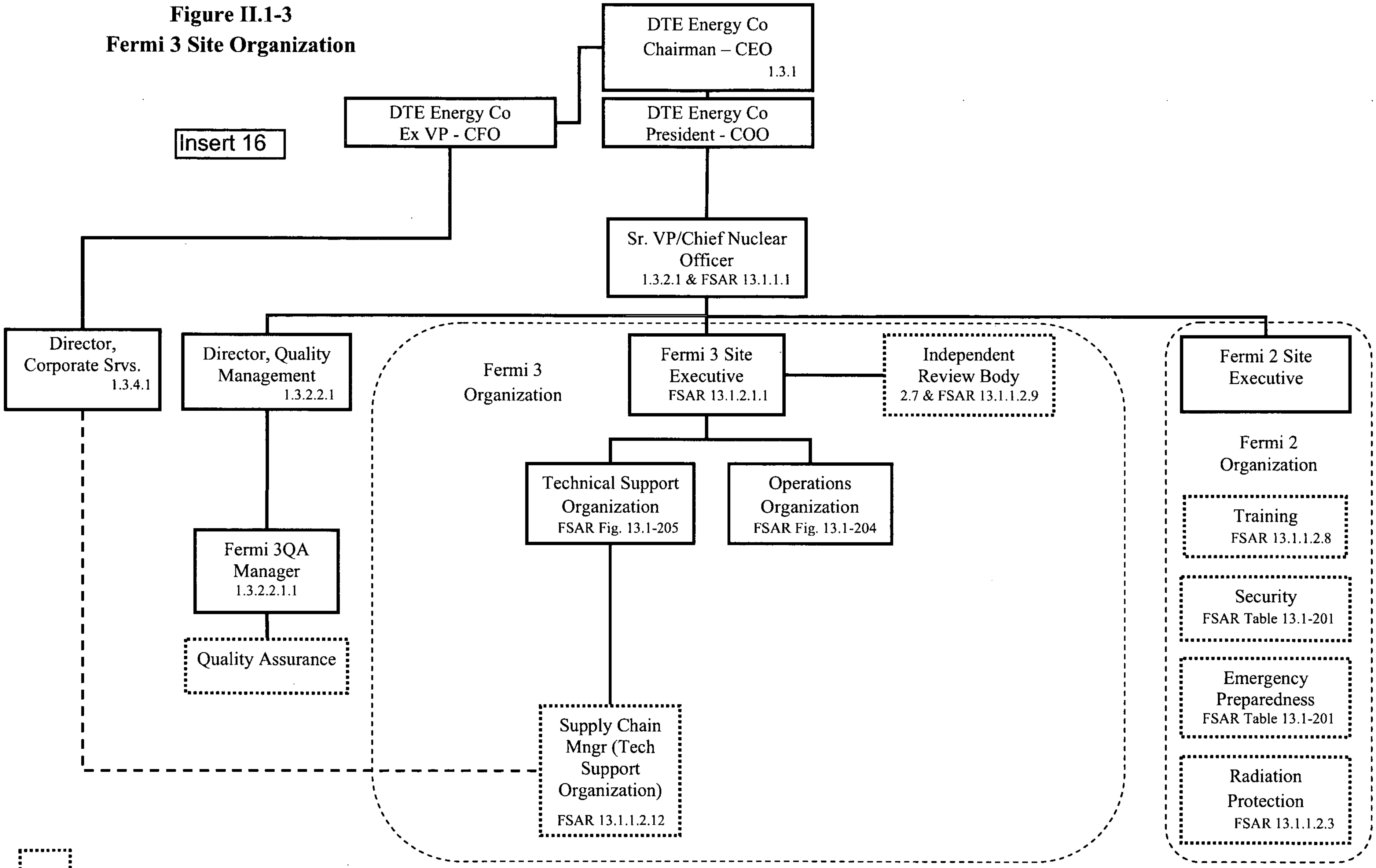
[dotted box] Indicates organizations that, although separate, share resources with Fermi 2 but a single management organization provides oversight for Fermi 3

– – Signifies functional relationship

Applicable QAPD section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR indicated cross reference to Chapter 13 section or figure

Figure II.1-3
Fermi 3 Site Organization

Insert 16



Indicates organizations that, although separate, share resources with Fermi 2 but a single management organization provides oversight for Fermi 3

Signifies functional relationship

Applicable QAPD section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR indicated cross reference to Chapter 13 section or figure

- The accreditation is based on ANS/ISO/IEC 17025.

- The published scope of accreditation for the calibration laboratory covers the necessary measurement parameters, ranges, and uncertainties.

- For Section 8.1, Fermi 3 considers documents that may be stored in approved electronic media under Fermi 3 or vendor control and not physically located on the plant site but which are accessible from the respective nuclear facility site as meeting the NQA-1 requirement for documents to be available at the site. Following completion of the construction period, sufficient as-built documentation will be turned over to Fermi 3 to support operations. The Fermi 3 records management system will provide for timely retrieval of necessary records.

- In lieu of the requirements of Section 10, Commercial Grade Items, controls for commercial grade items and services are established in Fermi 3 documents using 10 CFR 21 and the guidance of EPRI NP-5652 as discussed in Generic Letter 89-02 and Generic Letter 91-05.

- For commercial grade items, special quality verification requirements are established and described in Fermi 3 documents to provide the necessary assurance an item will perform satisfactorily in service. The Fermi 3 documents address determining the critical characteristics that ensure an item is suitable for its intended use, technical evaluation of the item, receipt requirements, and quality evaluation of the item.

- Fermi 3 will also use other appropriate approved regulatory means and controls to support Fermi 3 commercial grade dedication activities. ~~One example of this is Electric Power Research Institute (EPRI) Topical Report TR-106439, "Guideline on Evaluation and Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Applications," dated July 17, 1997.~~ Fermi 3 will assume 10 CFR 21 reporting responsibility for all items that Fermi 3 dedicates as safety-related.

Attachment 11
NRC3-10-0016

Response to RAI Letter No. 25
(eRAI Tracking No. 4380)

RAI Question No. 17.5-13

NRC RAI 17.5-13

SRP Section 17.5 part II, subsection A, "Organization," states that the applicant's QAPD should 1) contain an organizational description that addresses the organizational structure, functional responsibilities, levels of authority, and interfaces, 2) include the onsite and offsite organizational elements that function under the cognizance of the QA program, 3) define the interface responsibilities for multiple organizations.

The NRC endorsed Nuclear Energy Institute (NEI) QAPD template (NEI 06-14, Revision 7, "Quality Assurance Program Description") as a method for providing a QAPD that meets the requirements of 10 CFR Part 50, Appendix B.

Attachment 6 to NRC3-09-0027, "Detroit Edison Company Response to NRC RAI Letter No. 10," dated September 30, 2009, states FSAR Appendix 17AA, Part II, Section 1, Fermi 3 QAPD "Organization" will be revised to reflect NEI 06-14, Revision 7.

Proposed changes to the Fermi 3 QAPD (FSAR Appendix 17AA) Part II, Section 1, provided as part of Insert 1 of Attachment 5 to NRC3-09-0027, "Detroit Edison Company Response to NRC RAI Letter No.10," dated September 30, 2009, provides detailed organization and position descriptions for the pre-COL, design and construction, and operational organizations. Please clarify the following for proposed changes to section 1 of the QAPD, Part II, or provide justification for any exceptions to the guidance provided in SRP Section 17.5 part II, subsection A, and NEI 06-14, Revision 7:

a) *Section 1 states Major Enterprise Projects, specifically the Nuclear Development (ND) organization, is responsible for new nuclear plant licensing, engineering, procurement, construction, startup and operations development activities. Section 1.1.2.1 and section 1.2.2.1 state the Sr. VP MEP is responsible to size the Fermi 3 Quality Assurance organization commensurate with the duties and responsibilities assigned through construction. Please clarify who is responsible for Fermi 3 QA organization sizing for the startup and testing phases, and define any QA sizing responsibility transition points.*

b) *Section 1.1.2.2 and section 1.2.2.2 state the Director, Nuclear Development reports to the Sr. VP MEP and to the CNO and is responsible for the implementation of quality assurance requirements in the areas specified by the QAPD. Please clarify the "specified" areas in the QAPD and who has responsibilities for other "unspecified" areas.*

c) *Please clarify the difference in functional responsibilities between Corporate Services organization and the MEP Program Office.*

d) *Please clarify in the section 1 text and organization charts the location (on-site verses off-site) for the described organization and position elements.*

Note: This RAI is supplemental to RAI 17.5-5 and RAI 17.5-6 included in NRC RAI Letter No. 10, dated August 12, 2009.

Response

a) *Section 1 states Major Enterprise Projects, specifically the Nuclear Development (ND) organization, is responsible for new nuclear plant licensing, engineering, procurement, construction, startup and operations development activities. Section 1.1.2.1 and section 1.2.2.1 state the Sr. VP MEP is responsible to size the Fermi 3 Quality Assurance organization commensurate with the duties and responsibilities assigned through construction. Please clarify who is responsible for Fermi 3 QA organization sizing for the startup and testing phases, and define any QA sizing responsibility transition points.*

   The Sr. Vice President, Major Enterprise Projects is responsible for sizing the Fermi 3 Quality Assurance organization commensurate with the duties and responsibilities through construction, including the startup and testing phases. The Fermi 3 QAPD, presented in Appendix 17AA, is being revised to add this additional detail as shown in the attached markup.

   The Quality Assurance organization will be sized by the identified management representative:

   > The Sr. VP MEP during COLA activities and design and construction (including startup and testing) phases, and
   >
   > Director Quality Management (DQM) during the Operational phase

   commensurate with the duties and responsibilities of the QA organization. The QA sizing transition points have not been identified beyond the COLA activities phase. The sizing of the current QA organization is commensurate with its duties and responsibilities.

b) *Section 1.1.2.2 and section 1.2.2.2 state the Director, Nuclear Development reports to the Sr. VP MEP and to the CNO and is responsible for the implementation of quality assurance requirements in the areas specified by the QAPD. Please clarify the "specified" areas in the QAPD and who has responsibilities for other "unspecified" areas.*

   The Director, Nuclear Development reports to the Sr. VP MEP and to the Chief Nuclear Officer (CNO) and is responsible for the implementation of the quality assurance requirements. The Fermi 3 QAPD, presented in Appendix 17AA, is being revised to provide this clarification as shown in the attached markup.

c) *Please clarify the difference in functional responsibilities between Corporate Services organization and the MEP Program Office.*

   The MEP Program Office is responsible for the initiation, development, and issued content for solicitations and purchase orders necessary to support Fermi 3.

   Corporate Services is the legal representative authorized to solicit, enter, and manage contracts on behalf of Detroit Edison.

   The MEP Program Office works in conjunction with Corporate Services to provide procurement related activities in support of Fermi 3.

This functional relationship is now shown on QAPD Figure II.1-1 and the similarly functional relationship between the Supply Chain and Corporate Services presented in FSAR Subsection 13.1.1.2.12 is also now shown.

The organization presented in FSAR Subsection 13.1.1.2.12 was changed to "Supply Chain" and the presentation of the organizations function improved. The supply chain organization provides procurement, material handling, storage and logistics support, and maintains control of procurement logistics support. The supply chain organization also maintains control of procurement records generated and executed in the performance of its duties. The supply chain organization also performs the necessary functions to contract vendors of special services through its functional relationship with the Director, Corporate Services as presented in the markup to the QAPD accompanying this response.

d) Please clarify in the section 1 text and organization charts the location (on-site verses off-site) for the described organization and position elements.

Standard Review Plan (SRP) Section 17.5, Part II, Subsection A.3 states:

"The organizational description is to include the onsite and offsite organizational elements that function under the cognizance of the QA program."

The note to Figure II.1-1 in NEI 06-14, Rev. 7 states:

Organization charts should be included for all phases of applicability of the QAPD. Organization Charts should show on-site and off-site organizations implementing the QA Program

The organizational description presented in Appendix 17AA includes the onsite and offsite organizational elements that function under the cognizance of the Fermi 3 QA program. FSAR Figure 13.1-201 and QAPD Figures II.1-2 and II.1-3 have been revised to identify those organizational elements that are on the Fermi site.

Proposed COLA Revision

The revision to Appendix 17AA, "Fermi 3 Quality Assurance Program Description" detailing the relationship between the Director, Corporate Services and the MEP Programs office is shown in the attached markup. These revisions are also included with the markup provided with the response to RAI 17.5-12 in Attachment 10.

The revision to Chapter 13, "Conduct of Operations" detailing the relationship between the Director, Corporate Services and the site supply chain organization is shown in the attached markup. These revisions are also included with the markup provided with the response to RAI 17.5-10 in Attachment 8.

FSAR Figure 13.1-201 is being revised as shown in the attached markup. FSAR Figure 13.201 is also included in the markup provided with the response to RAI 17.5-10 in Attachment 8.

Appendix 17AA, "Fermi 3 Quality Assurance Program Description" Figures II.1-2 and II.1-3 are being revised as shown in the attached markup. Appendix 17AA Figures II.1-2 and II.1-3 are also included in the markup provided with the response to RAI 17.5-12 in Attachment 10.

Markup of Detroit Edison COLA
(following 17 page(s))

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

1.1.1 Chairman and CEO

The DTE Energy Chairman/CEO is responsible for all aspects of design, construction and operation of Detroit Edison's nuclear plants. The Chairman/CEO is also responsible for all technical and administrative support activities provided by Detroit Edison and contractors. The Chairman/CEO directs the Senior Vice President Major Enterprise Projects and the Sr. Vice President/CNO in fulfillment of their responsibilities. The Chairman/CEO reports to the DTE Energy Company Board of Directors with respect to all matters.

1.1.2 Major Enterprise Projects – Nuclear Development

The Major Enterprise Projects (MEP) organization, specifically Nuclear Development, is responsible for new nuclear plant licensing, engineering, procurement, construction, startup and operational development activities necessary to deliver new nuclear generating capacity to the Sr. Vice President/CNO. Nuclear Development will facilitate organizational transitions between Fermi 3 project phases. Nuclear Development is responsible for controlling interfaces between the operating units and any preconstruction or construction activities.

from pre-COL

including startup and intial testing

1.1.2.1 Senior Vice President, MEP

The Senior Vice President MEP (Sr. VP MEP) ultimately reports to the DTE Energy Chairman and CEO and is responsible for the administration of the Fermi 3 QAPD. The Sr. VP MEP also directs the planning and development of the Nuclear Development staff and organization resources as well as the initial Fermi 3 staff and organization resources. The Sr. VP MEP is responsible to size the Fermi 3 Quality Assurance organization commensurate with the duties and responsibilities assigned through construction. The Sr. VP MEP is also responsible for establishing and managing contracts for the development of new nuclear generation. The Sr. VP MEP shall transition the Nuclear Development organization through the Pre-COL / Design and Construction / Operations responsibilities described in the QAPD, as those Fermi 3 activities commence.

1.1.2.2 Director, Nuclear Development

The Director, Nuclear Development reports to the Sr. VP MEP and to the CNO and is responsible for the implementation of quality assurance requirements ~~in the areas~~ specified by the QAPD. For the purposes of this program, the description of the duties of the Director Nuclear Development and the Nuclear Development staff will be limited to those activities that support the Fermi COL application development.

1.1.2.2.1 Nuclear Development, Nuclear Licensing and Engineering

The Nuclear Development Licensing and Engineering (NDLE) organization is responsible for support of the Nuclear Development organization by providing engineering, licensing and document control support where applicable.

but not limited to Nuclear Development, engineering, licensing, document control, corrective action program and procurement that support preconstruction activities for Fermi 3. The QA organization reports to the Director, Quality Management.

1.1.3.2.1 Director, Quality Management

The Director, Quality Management (DQM) reports to the CNO and to the Sr. VP MEP for Fermi 3 activities and is responsible for developing and maintaining the Fermi 3 QAPD, evaluating compliance to the program and managing the QA organization resources. The DQM is responsible for developing and verification of implementation of the QAPD described in this document. The DQM is responsible for assuring compliance with regulatory requirements and procedures through audits and technical reviews; for monitoring organization processes to ensure conformance to commitments and licensing document requirements; for ensuring that vendors providing quality services, parts and materials to Fermi 3 are meeting the requirements of 10 CFR 50, Appendix B through Nuclear Procurement Issues Committee (NUPIC) or Detroit Edison vendor audits. The DQM has sufficient independence from other Nuclear Development priorities to bring forward issues affecting safety and quality and makes judgments regarding quality in all areas necessary regarding Fermi 3's Nuclear Development activities. The DQM may make recommendations to Fermi 3 management regarding improving the quality of work processes. If the DQM disagrees with any actions taken by the Nuclear Development organization and is unable to obtain resolution, the DQM shall bring the matter to the attention of the CNO who will determine the final disposition.

1.1.4 Corporate Services

The Corporate Services organization is responsible for supporting the Nuclear Development organization ~~through performing activities related to procurement, contract management,~~ business performance, records management, logistics, etc. where applicable.

and

. Corporate Services also supports Nuclear Development, and the MEP Program Office by providing

1.1.4.1 Director, Corporate Services

The Director, Corporate Services reports to the DTE Energy Executive Vice President and CFO and is responsible for managing the overall Corporate Services organization including assuring that Supply Chain Management, Financial and Operational Performance, and Materials and Logistics support for Nuclear Development activities ~~in accordance with the QAPD.~~

and the MEP Program Office by

1.1.5 Authority to Stop Work

Quality assurance and inspection personnel have the authority, and the responsibility, to stop work in progress which is not being performed in accordance with approved procedures or where safety or SSC integrity may be jeopardized. This extends to off-site work performed by suppliers that furnish safety-related materials and services to Fermi 3.

1.1.6 Quality Assurance Organizational Independence

through construction. The Sr. VP MEP is also responsible for establishing and managing contracts for the development of new nuclear generation. The Sr. VP MEP shall transition the Nuclear Development organization through the Pre-COL / Design and Construction / Operations responsibilities described in the QAPD, as those Fermi 3 activities commence.

1.2.2.2.1 Director, Nuclear Development

The Director, Nuclear Development reports to the Sr. VP MEP and to the CNO and is responsible for the implementation of quality assurance requirements in the areas specified by the QAPD. For the purposes of this program, the description of the duties of the Director Nuclear Development and the Nuclear Development staff will be limited to those activities that support the Fermi 3 Design and Construction activities.

1.2.2.2.2 Nuclear Development, Nuclear Licensing and Engineering

The Nuclear Development Licensing and Engineering (NDLE) organization is responsible for support of the Nuclear Development organization by providing engineering, licensing and document control support where applicable.

1.2.2.2.2.1 Director, Nuclear Licensing and Engineering

The Director, Nuclear Licensing and Engineering reports to the Director Nuclear Development and is responsible for the administration of engineering, nuclear fuel and nuclear licensing and support activities for Fermi 3 under the QAPD.

1.2.2.2.2.2 COL Contractor

The COL Contractor provides engineering services in support of licensing activities necessary to support updates, changes, etc. to the COL. These engineering services include site-specific license engineering, and design activities necessary to support development of proposed COL updates, changes etc., and planning and support for preconstruction and construction of Fermi 3.

1.2.2.3 MEP Program Office

The MEP Program Office is responsible for supporting the Nuclear Development organization through performing activities related to procurement, budget, planning, etc. where applicable.

1.2.2.3.1 Director, MEP Program Office

The Director, MEP Program Office reports to the Sr. VP MEP and is responsible for managing the MEP support functions for Nuclear Development activities in accordance with the QAPD.

~~1.2.3~~ **~~Corporate Services~~**

~~The Corporate Services organization is responsible for supporting the Nuclear Development organization through performing activities related to procurement, contract management, business performance, records management, logistics, etc., where applicable.~~

~~1.2.3.1 Director, Corporate Services~~

~~The Director, Corporate Services reports to the DTE Energy Executive Vice President and CFO and is responsible for managing the overall Corporate Services organization including assuring that Supply Chain Management, Financial and Operational Performance, and Materials and Logistics support for Nuclear Development activities in accordance with the QAPD.~~

1.2.3.1 Senior Vice President / CNO

The Senior Vice President/CNO ultimately reports to the Chairman and CEO and is responsible for the overall administration of Detroit Edison nuclear plants as described in Section 1.3.2.1

1.2.3.2 Quality Assurance

The Fermi 3 Quality Assurance Organization is responsible for independently planning and performing activities to verify the development and effective implementation of the Fermi 3 QAPD as described in Section 1.3.2.2

1.2.3.2.1 Director, Quality Management

The DQM is responsible for developing and maintaining the Fermi 3 QAPD from COL through to and including operations as described in Section 1.3.2.2.1

1.2.3.2.1.1 Fermi 3 Quality Assurance Project Manager

The Fermi 3 Quality Assurance Project Manager (QAPM) reports to the DQM and is responsible for the development and verification of implementation of the QAPD described in this document. The QAPM is responsible for assuring compliance with regulatory requirements and procedures through audits and technical reviews; ~~for~~ monitoring organization processes to ensure conformance to commitments and licensing document requirements; ~~for~~ ensuring that vendors providing quality services, parts and materials to Fermi 3 are meeting the requirements of 10 CFR 50, Appendix B through Nuclear Procurement Issues Committee (NUPIC) or Detroit Edison vendor audits. The QAPM has sufficient independence from other Fermi 3 priorities to bring forward issues affecting safety and quality and makes judgments regarding quality in all areas necessary regarding Fermi 3 activities. The QAPM may make recommendations to Fermi 3 management regarding improving the quality of work processes. If the QAPM disagrees with any actions taken by the Fermi 3 organization and is unable to obtain resolution, the QAPM shall inform the DQM who will bring the matter to the attention of the CNO to determine the final disposition. As the QA organization transitions from design and construction to operations (i.e. the project phase ends), the QAPM becomes the Fermi 3 Quality Assurance Manager described in Section 1.3.2.1.1.1.

1.2.3.3 Site Organization

The Fermi 3 site organization executes all activities for operations, maintenance, security, training, pre-operational testing, startup testing, emergency planning, etc. of the Fermi 3 systems, structures and components (SSC), or portions thereof to support transfer from the construction contractor to the cognizant owner departments as described in FSAR Appendix 13AA, Section 13AA.2.2.

Insert 9

1.2.5.2 NSSS

~~NSSS~~ provides engineering services for plant design and licensing of Fermi 3 on the Detroit Edison site. These engineering services for Fermi 3 include site-specific engineering and design necessary to support preconstruction and construction activities associated with the nuclear steam supply system (NSSS), i.e. the certified portion of the design.

1.2.5.3 A/E

A/E Firm provides engineering services for the development of the COL application. These engineering services include site-specific license engineering, and design activities necessary to support development of the COL application, and planning and support for preconstruction and construction activities for Fermi 3.

1.2.6 Authority to Stop Work

Quality assurance and inspection personnel have the authority, and the responsibility, to stop work in progress which is not being performed in accordance with approved procedures or where safety or SSC integrity may be jeopardized. This extends to off-site work performed by suppliers that furnish safety-related materials and services to Fermi 3.

1.2.7 Quality Assurance Organizational Independence

For the Design and Construction phase, independence shall be maintained between the organization or organizations performing the checking (quality assurance and control) functions and the organizations performing the functions. This provision is not applicable to design review/verification.

1.2.8 NQA-1-1994 Commitment

In establishing its organizational structure, Fermi 3 commits to compliance with NQA-1-1994, Basic Requirement 1 and Supplement 1S-1.

1.3 Fermi 3 Operational Organization

This section describes the organizational structure for the operational activities of Fermi 3 and the Fermi 3 Site organizational structure is shown in Figure II.1-3.

1.3.1 Chairman and CEO

The Chairman/CEO is responsible for all aspects of design, construction and operation of Detroit Edison's nuclear plants as described in Section 1.1.1

1.3.2.1 Senior Vice President / CNO

Insert 9

1.2.4 Corporate Services

The Corporate Services organization is responsible for supporting the Nuclear Development organization, the MEP Program Office, and the operating (see FSAR Subsection 13.1.2) and technical support (see FSAR Subsection 13.1.1) organizations through executing activities related to procurement, contract management and business performance. Corporate Services also supports Nuclear Development, the MEP Program Office and the site organization providing records management, logistics, etc. ~~where applicable~~.

1.2.4.1 Director, Corporate Services

The Director, Corporate Services reports to the DTE Energy Executive Vice President and Chief Financial Officer and is responsible for overall management of the Corporate Services organization, including ~~assuring that~~ Supply Chain Management, Financial and Operational Performance, and materials and logistic support for Nuclear Development through the MEP Program Office, and the operating (see FSAR Subsection 13.1.2) through technical support (see FSAR Subsection 13.1.1) organizations ~~activities in accordance with the QAPD~~.

The Senior Vice President/CNO ultimately reports to the Chairman and CEO and is responsible for the overall administration of Detroit Edison nuclear plants. The CNO is the ultimate management authority for establishing QA policy and responsibility for the QA function. Reporting to the CNO are the Director Quality Management and the Fermi 3 Site Executive.

1.3.2.2 Quality Assurance

The Fermi 3 Quality Assurance Organization is responsible for independently planning and performing activities to verify the development and effective implementation of the Fermi 3 QAPD including but not limited to engineering, licensing, document control, corrective action program and procurement that support Fermi 3 operations. Personnel resources of the QA organization are shared between units. The Fermi 3 Quality Assurance Manager, ~~see 1.3.2.1.1.1,~~ oversees the QA group for the Fermi 3 site.

1.3.2.2.1 Director, Quality Management

The DQM reports to the CNO for the operations activities and is responsible for developing and maintaining the Fermi 3 QAPD, evaluating compliance to the programs and managing the QA organization resources. The DQM is responsible to size the Quality Assurance organization commensurate with the duties and responsibilities assigned during operations.

1.3.2.2.1.1 Fermi 3 Quality Assurance Manager

The Fermi 3 Quality Assurance Manager (QAM) reports to the DQM and is responsible for the development and verification of implementation of the QAPD described in this document. The QAM is responsible for assuring compliance with regulatory requirements and procedures through audits and technical reviews; for monitoring organization processes to ensure conformance to commitments and licensing document requirements; for ensuring that vendors providing quality services, parts and materials to Fermi 3 are meeting the requirements of 10 CFR 50, Appendix B through Nuclear Procurement Issues Committee (NUPIC) or Detroit Edison vendor audits. The QAM has sufficient independence from other Fermi 3 priorities to bring forward issues affecting safety and quality and makes judgments regarding quality in all areas necessary regarding Fermi 3 activities. The QAM may make recommendations to Fermi 3 management regarding improving the quality of work processes. If the QAM disagrees with any actions taken by the Fermi 3 organization and is unable to obtain resolution, the QAM shall inform the DQM who will bring the matter to the attention of the CNO to determine the final disposition.

~~1.3.3 Corporate Services~~

~~The Corporate Services organization is responsible for supporting the Nuclear Development organization through performing activities related to procurement, contract management, business performance, records management, logistics, etc., where applicable.~~

1.3.3.1 **Director, Corporate Services**

The Director, Corporate Services reports to the DTE Energy Executive Vice President and CFO and is responsible for managing the overall Corporate Services organization including assuring that Supply Chain Management, Safety and Health and Information Technology support Nuclear Development activities in accordance with the QAPD.

1.3.3 **Fermi 3 Operating Organization**

The Fermi 3 Operating Organization executes all activities for operations, maintenance, security, training, modification, outage management, procurement, engineering, emergency planning, etc. of the Fermi 3 plant site. The Fermi 3 Operating Organization is responsible for operations quality inspection activities of operations on-site work, as well as controlling interfaces between the Nuclear Development organization (for future or continuing capital projects), operating units, and any preconstruction or construction activities. Full details of the Fermi 3 Operating Organization are available in FSAR Chapter 13.

Insert 13

1.3.5 **Authority to Stop Work**

Quality assurance and inspection personnel have the authority, and the responsibility, to stop work in progress which is not being performed in accordance with approved procedures or where safety or SSC integrity may be jeopardized. This extends to off-site work performed by suppliers that furnish safety-related materials and services to Fermi 3.

1.3.6 **Quality Assurance Organizational Independence**

Independence shall be maintained between the organization or organizations performing the checking (quality assurance and control) functions and the organizations performing the functions. This provision is not applicable to design review/verification.

1.3.7 **NQA-1-1994 Commitment**

In establishing its organizational structure, Fermi 3 commits to compliance with NQA-1-1994, Basic Requirement 1 and Supplement 1S-1.

Insert 13

1.3.4 Corporate Services
The Corporate Services organization is responsible for supporting the ~~Nuclear Development~~ operating organization (see FSAR Subsection 13.1.2) and technical support organization (see FSAR Subsection 13.1.1) through executing activities related to procurement, contract management and business performance. Corporate Services also supports the site organization providing records management, logis~~tics, etc. where ap~~plicable.

1.3.4.1 Director, Corporate Services
The Director, Corporate Services reports to the DTE Energy Executive Vice President and Chief Financial Officer and is responsible for overall management of the Corporate Services organization, including ~~assuring that~~ Supply Chain Management, ~~Safety and Health~~, Financial and Operational Performance, and ~~Information Technology support Nuclear Development activities~~, materials and logistic support to the operating organization (see FSAR Subsection 13.1.2) through the technical support organization (see FSAR Subsection 13.1.1) ~~activities in accordance with the QAPD~~.

responsible for adhering to the fire protection/prevention requirements detailed in Subsection 9.5.1. The site construction executive will have the lead responsibility for overall construction site fire protection during construction. The fire brigade is described in Subsection 13.1.2.1.5.

13.1.1.2.11 **Emergency Organization**

The emergency preparedness organization is a matrixed organization composed of personnel who have the experience, training, knowledge, and ability necessary to implement actions to protect the public in the case of emergencies. Managers and station personnel assigned to positions in the emergency organization are responsible for supporting the emergency preparedness organization and the emergency plan as required. The staff members of the emergency planning organization administer and orchestrate drills and training to maintain qualification of station staff members, and develop procedures to guide and direct the emergency organization during an emergency. The functional manager in charge of emergency preparedness reports to the director responsible for facility safety and licensing. The site emergency plan organization is described in the Emergency Plan.

Supply Chain

Insert 2

13.1.1.2.12 ~~**Outside Contractual Assistance**~~

~~Contract assistance with vendors and outside suppliers is provided by the materials, procurement, and contracts organization~~. The functional manager in charge of materials, procurement, and contracts reports to the site support director.

and has a functional relationship with Director of Corporate Services (see also Appendix 17AA, Part II)

Resources and management of the materials, procurement, and contracts organization are shared between units.

A single management organization oversees the materials, purchasing and contracts groups for all site units.

13.1.1.3 **Organizational Arrangement**

Organizational arrangement for corporate offices and site organizations reporting directly to corporate offices is presented in Section 17.5.

13.1.1.4 **Qualifications of Technical Support Personnel**

Personnel of the technical support organization meet the education and experience qualifications for those described in ANSI/ANS-3.1 (Reference 13.1-201) as endorsed and amended by RG 1.8.

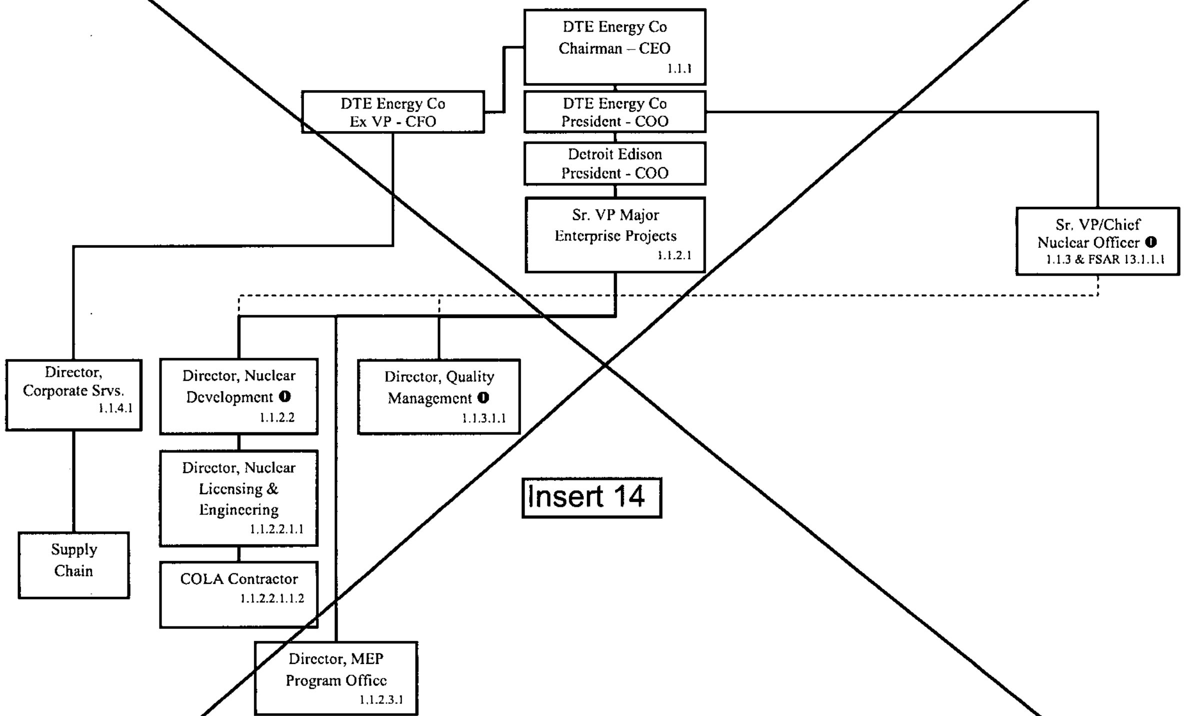
13.1.2 **Operating Organization**

13.1.2.1 **Plant Organization**

Insert 2

The supply chain organization provides procurement, material handling, storage, and logistics support. The supply chain organization maintains control of procurement records generated and executed in the performance of its duties. In addition, the supply chain organization perform the necessary functions to contract vendors of special services to perform tasks for which the utility does not have experience or the equipment required.

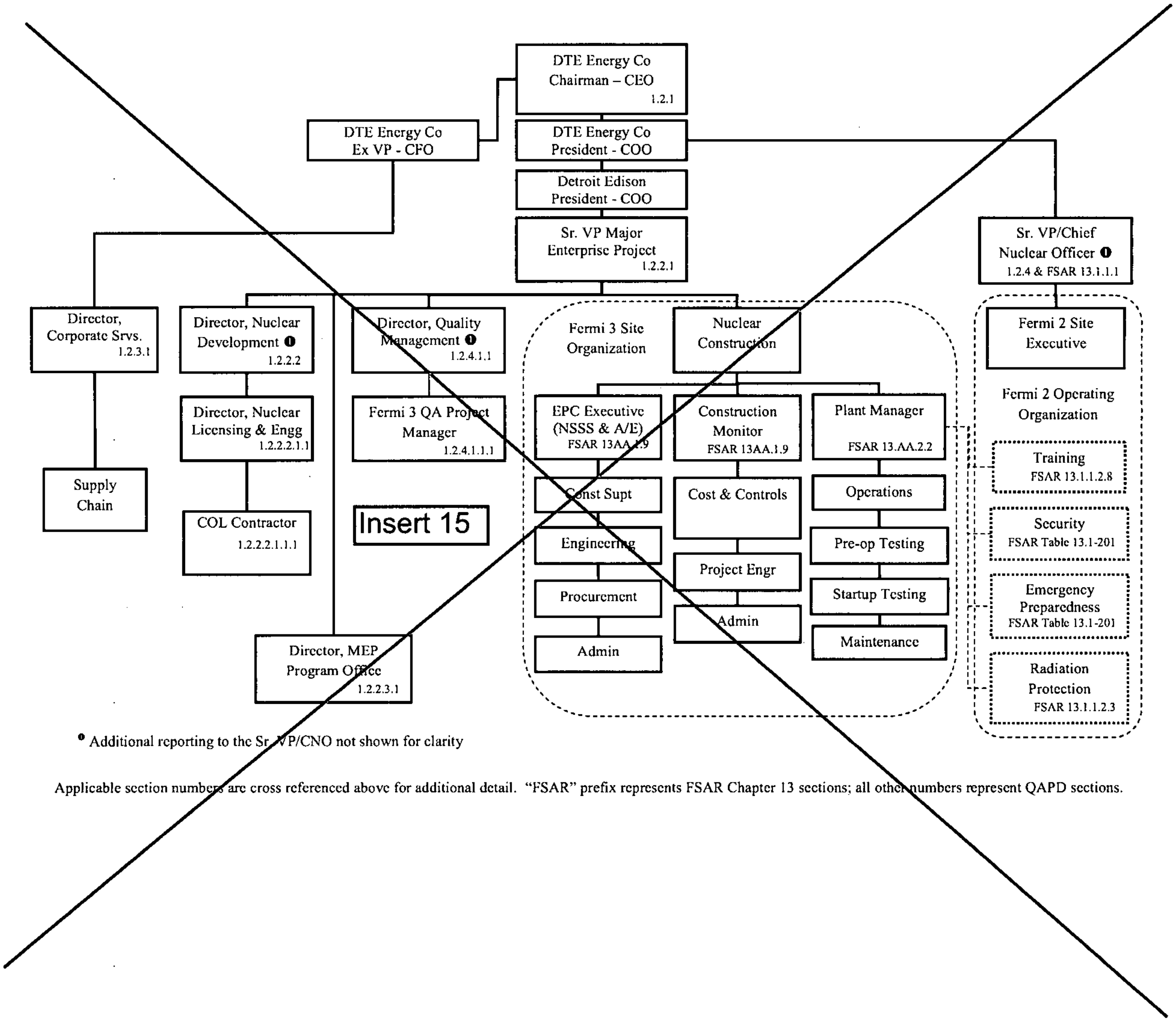
Figure II.1-1 Fermi 3 Pre-COL Organizational Structure



❶ Additional reporting to the Sr. VP/CNO

Applicable section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR Chapter 13 sections; all other numbers represent QAPD sections.

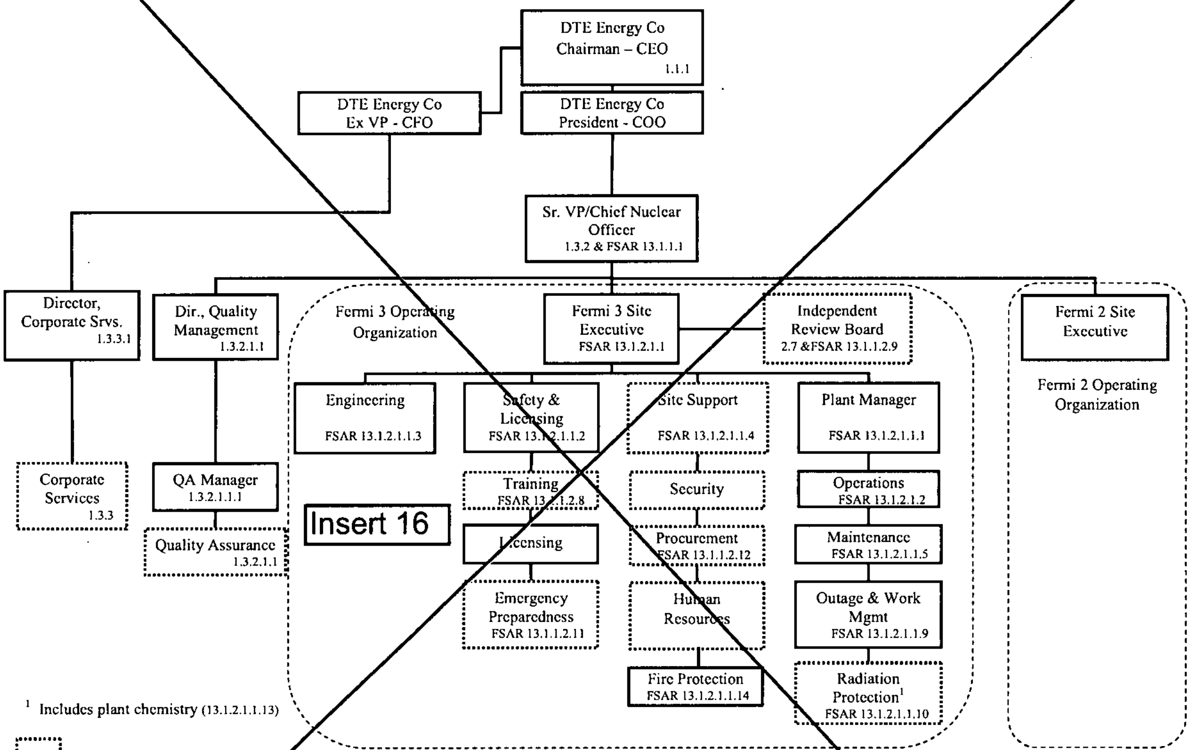
Figure II.1-2 Design and Construction Organization



❶ Additional reporting to the Sr. VP/CNO not shown for clarity

Applicable section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR Chapter 13 sections; all other numbers represent QAPD sections.

Figure II.1-3 Fermi 3 Operating Organizational Structure



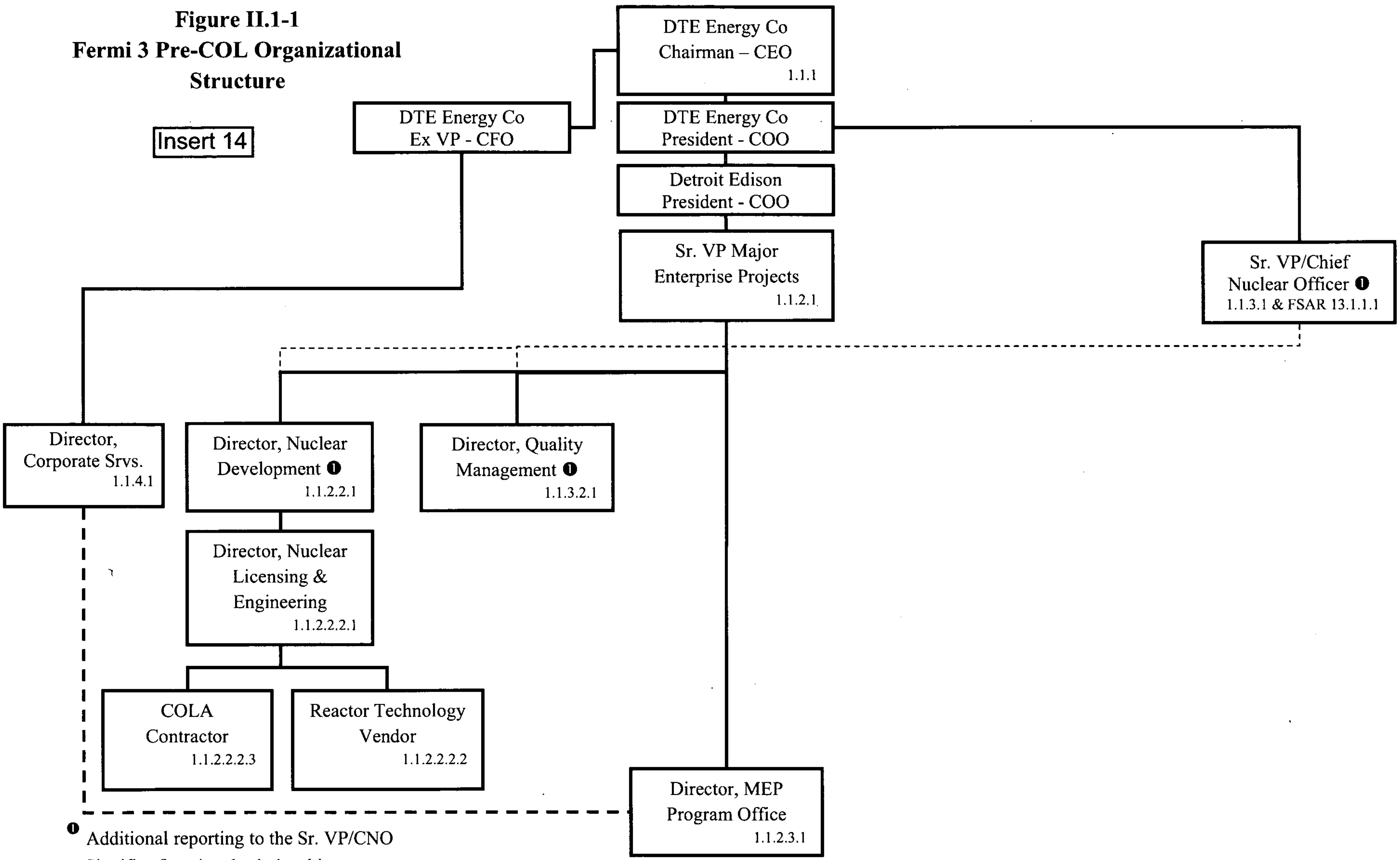
[1] Includes plant chemistry (13.1.2.1.1.13)

Indicates organizations that, although separate, share resources with Fermi 2 but a single management organization provides oversight for Fermi 3

Applicable section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR Chapter 13 sections; all other numbers represent QAPD sections.

Figure II.1-1
Fermi 3 Pre-COL Organizational Structure

Insert 14

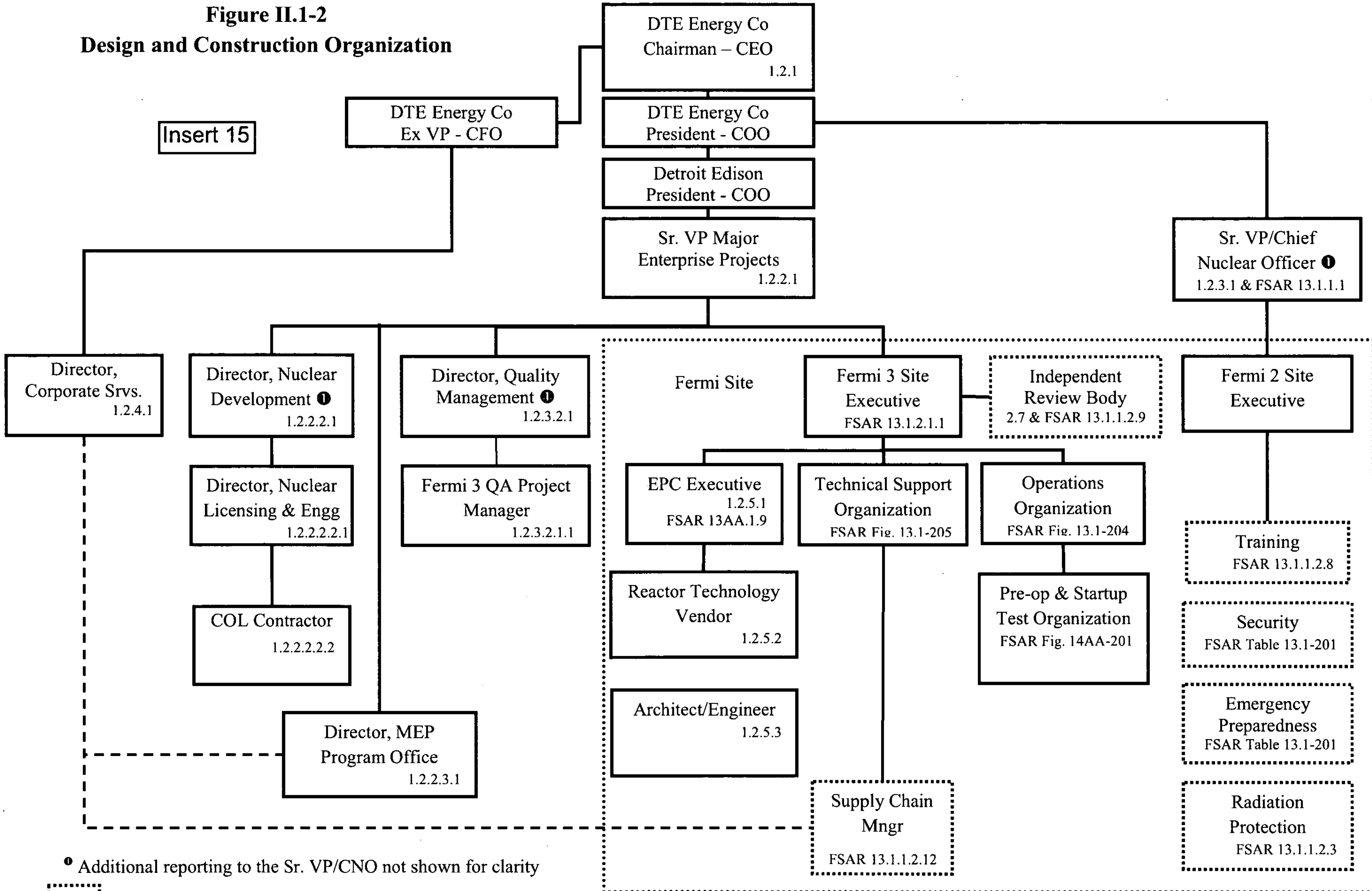


❶ Additional reporting to the Sr. VP/CNO

- - - Signifies functional relationship

Applicable QAPD section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR indicated cross reference to Chapter 13 section or figure

Figure II.1-2
Design and Construction Organization



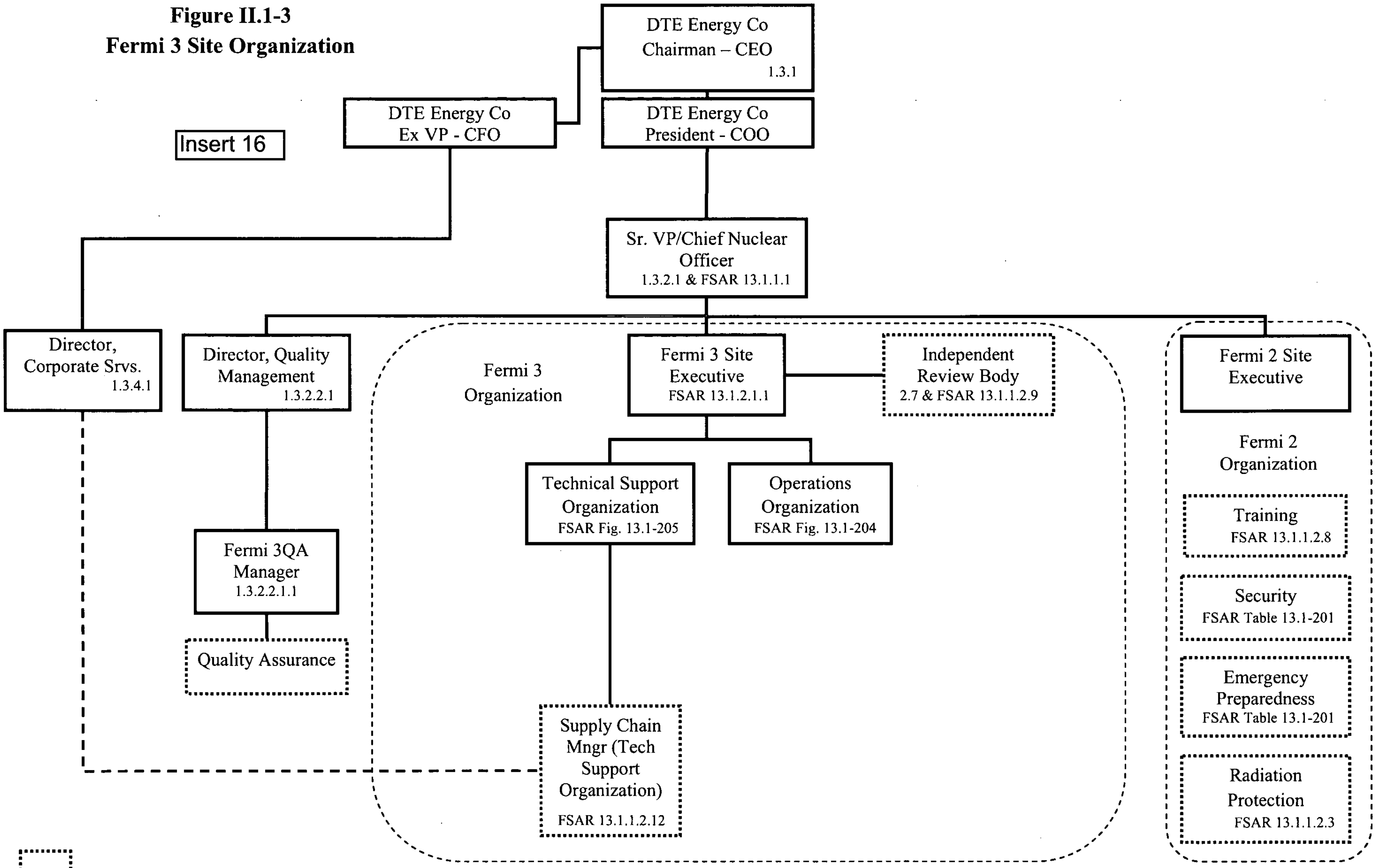
1 Additional reporting to the Sr. VP/CNO not shown for clarity

(dotted box) Indicates organizations that, although separate, share resources with Fermi 2 but a single management organization provides oversight for Fermi 3

– – Signifies functional relationship

Applicable QAPD section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR indicated cross reference to Chapter 13 section or figure .

Figure II.1-3
Fermi 3 Site Organization



Indicates organizations that, although separate, share resources with Fermi 2 but a single management organization provides oversight for Fermi 3

Signifies functional relationship

Applicable QAPD section numbers are cross referenced above for additional detail. "FSAR" prefix represents FSAR indicated cross reference to Chapter 13 section or figure

Attachment 12
NRC3-10-0016

Response to RAI Letter No. 25
(eRAI Tracking No. 4381)

RAI Question No. 17.5-14

NRC RAI 17.5-14

SRP Section 17.5 part II, subsection A, "Organization," states that the applicant's QAPD should 1) contain an organizational description that addresses the organizational structure, functional responsibilities, levels of authority, and interfaces, 2) include the onsite and offsite organizational elements that function under the cognizance of the QA program, 3) define the interface responsibilities for multiple organizations.

Attachment 5 to NRC3-09-0027, "Detroit Edison Company Response to NRC RAI Letter No. 10," dated September 30, 2009, states it is appropriate to manage any changes to the organizational description provided in Chapter 13 in accordance with 10 CFR 50.54(a) to consistently ensure NRC review and approval.

Proposed changes to the Fermi 3 FSAR, Part II, Chapter 13.1.1, provided as part of Attachment 5 to NRC3-09-0027, "Detroit Edison Company Response to NRC RAI Letter No. 10," dated September 30, 2009, inserts a new paragraph clarifying review requirements for organizational changes and addressing 10 CFR 50.54(a) applicability.

Please clarify when changes to organization elements of FSAR, Part II, Chapter 13 will be reviewed under 10 CFR 50.54(a). The proposed changes to the Fermi 3 FSAR, Part II, Chapter 13.1.1, appear to apply to only section 13.1.1, while organizational elements appear in other sections of Chapter 13, including Chapter 13.1.2, "Operating Organization," and Appendix 13AA, "Design and Construction Responsibilities."

Note: This RAI is supplemental to RAI 17.5-6 included in NRC RAI Letter No. 10, dated August 12, 2009.

Response

Detroit Edison intends to review organizational changes against the requirements of 10 CFR 50.54(a).

Proposed COLA Revision

The last paragraph of FSAR Section 13.1.1 providing the review requirements for organizational changes and addressing 10 CFR 50.54(a) applicability provided as a proposed change to Fermi 3 FSAR, Part II, Chapter 13.1.1 in the original response to RAI 17.5-14 is being moved forward to FSAR Section 13.1 and will add the clarification that 10 CFR 50.54(a) applies to the Fermi 3:

> Design and Construction organization described in Appendix 13AA, Appendix 14AA and Appendix 17AA, Part II, Subsection 1.2;
>
> Management and Technical Support organization described in FSAR Subsection 13.1.1 and Appendix 17AA, Part II, Subsection 1.3, and

Operating Organization described in FSAR Subsection 13.1.2 and Appendix 17AA, Part II, Subsection 1.3

as shown in the attached markup.

Markup of Detroit Edison COLA
(following 1 page(s))

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

Changes to the organization described herein:

Design and Construction organization described in Appendix 13AA, Appendix 14AA, and Appendix 17AA, Part II, Subsection 1.2;

Technical Support organization described in Subsection 13.1.1, and Appendix 17AA, Part II, Subsection 1.3; and

Operating organization described in Subsection 13.1.2 and Appendix 17AA, Part II, Subsection 1.3

are reviewed under the provisions of 10 CFR 50.54(a) to ensure that any reduction in commitments in the QAPD (as accepted by the NRC) are submitted to an approved by the NRC, prior to implementation.

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

DCD Section 13.1.1, Combined License Information, is renumbered in this FSAR as Subsection 13.1.4 for administrative purposes to allow section numbering to be consistent with RG 1.206 and the Standard Review Plan.

Replace the first paragraph with the following.

EF3 COL 13.1-1-A

This section describes the organization of Fermi 3. The organizational structure is described in this section and is consistent with the Human System Interface (HSI) design assumptions used in the design of the ESBWR as described in DCD Chapter 18. The organizational structure is consistent with the ESBWR HFE design requirements and complies with the requirements of 10 CFR 50.54(i) through (m).

13.1.1 Management and Technical Support Organization

Detroit Edison has over 35 years of experience in the operation of nuclear generating stations. Detroit Edison currently operates Fermi 2.

Corporate offices provide support for Fermi site including executive level management to provide strategic and financial support for plant initiatives, and coordination of functional efforts.

Section 17.5 provides high-level illustrations of the corporate organization. More detailed charts and position descriptions, including qualification requirements and staffing numbers for corporate support staff, are maintained in corporate offices.

~~Changes to the organization described herein are reviewed under the provisions of 10 CFR 50.54(a) to ensure that any reduction in commitments in the QAPD (as accepted by the NRC) are submitted to, and approved by the NRC, prior to implementation~~.

Attachment 13
NRC3-10-0016

Response to RAI Letter No. 25
(eRAI Tracking No. 4382)

RAI Question No. 17.5-15

NRC RAI 17.5-15

SRP Section 17.5 part II, subsection A, "Organization," states that the applicant's QAPD should 1) contain an organizational description that addresses the organizational structure, functional responsibilities, levels of authority, and interfaces, 2) include the onsite and offsite organizational elements that function under the cognizance of the QA program, 3) define the interface responsibilities for multiple organizations.

Fermi 3 FSAR, Part II, Appendix 13AA, "Design and Construction Responsibilities," third paragraph, states the organization for the construction and operation of Fermi 3 are described in Chapter 17 and Chapter 13, respectively.

Proposed changes to the Fermi 3 FSAR, Part II, Appendix 13AA.1.3, provided as part of Attachment 5 to NRC3-09-0027, "Detroit Edison Company Response to NRC RAI Letter No. 10," dated September 30, 2009, refers to Figure 13.1-201, Construction Organization, Section 13AA.1.9, Section 13AA.2.2, and the QAPD (incorporated into Section 17.5) for reporting relationships.

The Fermi 3 QAPD (FSAR Appendix 17AA) part II, section 1, and FSAR, Part II, Appendix 13AA contains varying content and depth of position description information. Staff review identified portions of the construction organization appear to be minimally described in Appendix 13AA and Figure 13.1-201, vice Chapter 17 as indicated in Appendix 13AA. Additionally, that the Fermi 3 site management position descriptions do not appear to meet the organizational guidance of the SRP section 17.5.

Please clarify which section of the FSAR will describe the design and construction organization and ensure Fermi 3 site management position descriptions meet the guidance of SRP Section 17.5 part II, subsection A, or provide justification for any exceptions to the guidance.

Note: This RAI is supplemental to RAI 17.5-6 included in NRC RAI Letter No. 10, dated August 12, 2009.

Response

The Quality Assurance Program Document (QAPD) cover sheet and the Fermi 3 policy "Quality Assurance During Construction and Operation" statement presented in Appendix 17AA have been revised to indicate, consistent with the QAPD in use by Nuclear Development, that the QAPD is approved by the Sr. Vice President, Major Enterprise Projects and the policy statement is his commitment to implement the QAPD.

QAPD, Part II, Section 1.2 incorporates Appendix 13AA and has been revised to incorporate Appendix 14AA to fully describe the Design and Construction Organization which includes the necessary operational elements to support and accept turnover of systems, structures and components. Additionally, the role of the operating organization in preoperational activities to transition systems, structures and components described in Appendix 13AA, Subsection 13AA.2 was improved.

QAPD, Part II, Section 1.2 describes those corporate executives and corporate support organizations supporting the design and construction of Fermi 3. A site executive, described in FSAR Subsection 13.1.2.1.1, was added to provide the necessary oversight and provide continuity from the design and construction phase to the operations phase. An Engineering, Procurement and Construction (EPC) contractor, a teaming organization that includes the reactor technology vendor with its NRC approved QAPD and the Architect/Engineer with its Detroit Edison approved QAPD, was added to provide a single point of contact, the EPC Executive, for interaction with the site executive. The responsibilities and authority for the EPC Executive, consistent with SRP Section 17.5, Part II, Subsection A, are indentified. The necessary control and oversight by Detroit Edison via the site executive and the Fermi 3 Quality Assurance Manager is specified as required by SRP Section 17.5, Part II, Subsection A.

Other enhancements to satisfy the guidance of SRP Section 17.5 Part II, Subsection A are addressed in the response to RAI 17.5-1 in Attachment 8.

Proposed COLA Revision

The markups to Appendix 13AA, "Design and Construction Responsibilities" and Appendix 14AA, "Description of Initial Test Program Administration" are provided with this response. These markups also show the changes to Appendix 13AA and Appendix 14AA resulting from the preparation of the response to the other QA related RAIs in this letter.

The markups to Chapter 1, "Introduction and General Description of the Plant" and "Chapter 13, "Conduct of Operations" are provided with the response to RAI 17.5-10 in Attachment 8. These markups also show the relevant changes to Chapter 1 and Chapter 13 resulting from the preparation of the response to the other QA related RAIs in this letter.

The markup to Appendix 17AA, "Fermi 3 Quality Assurance Program Description" is provided with RAI 17.5-12 in Attachment 10. The markup with RAI 17.5-12 in Attachment 10 also shows the changes to Appendix 17AA resulting from the preparation of the response to the other QA related RAIs in this letter.

Markup of Detroit Edison COLA
(following 20 page(s))

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

13.6-16-A **External Bullet Resisting Enclosures**

EF3 COL 13.6-16-A This COL item is addressed in Subsection 13.6.2

13.6-17-A **Site-Specific Locations of Security Barriers**

EF3 COL 13.6-17-A This COL item is addressed in Subsection 13.6.2

13.6-18-A **Ammunition for Armed Responders**

STD COL 13.6-18-A This COL item is addressed in Subsection 13.6.2

13.6-19-A **Site-Specific Update of the ESBWR Safeguards Assessment Report**

STD COL 13.6-19-A This COL item is addressed in Subsection 13.6.2

13.7 Fitness for Duty

STD SUP 13.7-1 The Fitness for Duty (FFD) Program is implemented and maintained in two phases: the construction phase program and the operating phase program. The construction phase program is consistent with NEI 06-06 (Reference 13.7-201), which is currently under NRC review. The construction phase program is implemented, as identified in Table 13.4-201, prior to on-site construction of safety- or security-related SSCs. The operations phase program is consistent with NEI 03-01 (Reference 13.7-201), which is currently under NRC review. The operations phase program is implemented prior to fuel receipt, as identified in Table 13.4-201.

correct differing font size

References

13.7-201 Nuclear Energy Institute (NEI) “Fitness for Duty Program Guidance for New Nuclear Power Plant Construction Sites,” NEI 06-06.

13.7-202 Nuclear Energy Institute (NEI) "Nuclear Power Plant Access Authorization Program," NEI 03-01.

EF3 COL 13.1-1-A

Appendix 13AA Design and Construction Responsibilities

13AA.1 **Design and Construction Activities**

Detroit Edison has substantial experience in the design, construction, and operation of nuclear power plants and substantial experience in activities of similar scope and complexity. Detroit Edison was responsible for the design and construction activities associated with Fermi 2. Detroit Edison oversaw the activities of a number of engineering, design and construction companies, including General Electric Company, Sargent &

Lundy, Stone & Webster, Parsons Company and Daniels Construction Company.

In addition, Detroit Edison has been responsible for the design, construction, and operation of several large fossil stations, activities of similar scope and complexity. With an 11,000 megawatt system capacity, the company has been associated with the construction and generation of power facilities such as coal, nuclear, natural gas and hydroelectric pumped storage. An'example is the Belle River coal facility, which generates in excess of 1000 MW.

EPC contractor responsible

the reactor technology vendor

Detroit Edison's management, engineering, and technical support organization for the construction and operation of Fermi 3 are described in Chapter 17 and Chapter 13, respectively. As described in Subsection 1.4.1, Detroit Edison has selected General Electric-Hitachi (GEH) as ~~its primary contractor~~ for the design of Fermi 3. The ~~primary contractors~~ for site engineering, and construction of the nuclear and turbine islands ~~have~~ not yet been selected.

, has

Other design and construction activities will be contracted to qualified suppliers of such services. Implementation or delegation of design and construction responsibilities is described in the sections below. Quality Assurance aspects are described in Chapter 17.

13AA.1.1 Principal Site-Related Engineering Work

The principal site engineering activities accomplished towards the construction and operation of the plant are:

Meteorology

Information concerning local (site) meteorological parameters is developed and applied by station and contract personnel to assess the impact of the station on local meteorological conditions. An onsite meteorological measurements program is employed by station personnel to produce data for the purpose of making atmospheric dispersion estimates for postulated accidental and expected routine airborne releases of effluents. A maintenance program is established for surveillance, calibration, and repair of instruments. More information regarding the study and meteorological program is found in Section 2.3.

Geology

Information relating to site and regional geotechnical conditions is developed and evaluated by utility and contract personnel to determine if geologic conditions could present a challenge to safety of the plant. Items of interest include geologic structure, seismicity, geological history, and ground water conditions. The excavation for safety-related structures are geologically mapped and photographed by experienced geologists. Unforeseen geologic features that are encountered are evaluated. Section 2.5 provides details of these investigations.

Seismology

Information relating to seismological conditions is developed and evaluated by utility and contract personnel to determine if the site location and area surrounding the site is appropriate from a safety standpoint for the construction and operation of a nuclear power plant. Information regarding tectonics, seismicity, correlation of seismicity with tectonic structure, characterization of seismic sources, and ground motion are assessed to estimate the potential for strong earthquake ground motions or surface deformation at the site. Section 2.5 provides details of these investigations.

Hydrology

Information relating to hydrological conditions at the plant site and the surrounding area is developed and evaluated by utility and contract personnel. The study includes hydrologic characteristics of streams, lakes, shore regions, the regional and local groundwater environments, and existing or proposed water control structures that could influence flood control and plant safety. Section 2.4 includes more detailed information regarding this subject.

Demography

Information relating to local and surrounding area population distribution is developed and evaluated by utility and contract personnel. The data is used to determine if requirements are met for establishment of exclusion area, low population zone, and population center distance. Section 2.1 includes more detailed information regarding population around the plant site.

Environmental Effects

Monitoring programs are developed to enable the collection of data necessary to determine possible impact on the environment due to construction, startup, and operational activities and to establish a baseline from which to evaluate future environmental monitoring. This program is described in the separately submitted Environmental Report.

the reactor technology vendor QA program and

technology

13AA.1.2 Design of Plant and Ancillary Systems

Design and construction of systems outside the power block such as circulating water, service water, switchyard, and secondary fire protection systems are performed by Detroit Edison or qualified contractors, as assigned.

the Operating Organization (see Subsection 13.1.2) or Technical Support (see Subsection 13.1.1.2)

13AA.1.3 Review and Approval of Plant Design Features

Design engineering review and approval is performed in accordance with Chapter 17. The reactor vendor is responsible for design control of the power block. ~~Design work is performed in accordance with the design and construction QA manual including the reviews necessary to verify the adequacy of the design.~~ Verification is performed by competent individuals or groups other than those who performed the original design. Design issues arising during construction are addressed and implemented with notification and communication of changes to the ~~manager in charge of engineering~~ for review. As systems are tested and approved for turnover and operation, control of design is turned over to ~~plant staff~~. The ~~manager in charge of engineering~~, along with functional managers and staff, assumes responsibility for review and approval of modifications, additions, or deletions in plant design features, as well as control of design documentation, in accordance with ~~the Operational QA Program~~. Design control becomes the responsibility of the ~~manager in charge of engineering~~ prior to loading fuel. During construction, startup, and operation, changes to human-system interfaces of control room design are approved using a Human Factors Engineering evaluation addressed within DCD Chapter 18. See Figure 13.1-201, Construction Organization,Subsection 13AA.1.9, Subsection 13AA.2.2, and the QAPD (incorporated into Section 17.5) for reporting relationships.

A/E within the EPC organization

Engineering Director (see Subsection 13.1.2.1.1.3)

Chapter 17

Engineering Director

13AA.1.4 Environmental Effects

Impact to the surrounding environment from construction and operating activities is fully addressed in the separately submitted Environmental Report.

(incorporated into Section 17.5)

13AA.1.5 Security Provisions

The Physical Security Plan is designed with provisions that meet the applicable NRC regulations. See Section 13.6 and the Security Plan, which was submitted under separate transmittal.

13AA.1.6 Development of Safety Analysis Reports

technology

Information regarding the development of the FSAR is found in Chapter 1.

technology

technology

13AA.1.7 Review and Approval of Material and Component Specifications

Safety-related material and component specifications of SSCs designed by the reactor vendor are reviewed and approved in accordance with the reactor vendor quality assurance program and Section 17.1. Review and approval of items not designed by the reactor vendor are controlled for review and approval by Section 17.5 and the QAPD.

the EPC organization

technology

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13AA.1.8 Procurement of Materials and Equipment

Procurement of materials during construction phase is the responsibility of the reactor vendor and ~~constructor~~. The process is controlled by the construction QA programs of these organizations. Oversight of the inspection and receipt of materials process is the responsibility of the ~~EPC executive~~.

Fermi 3 Quality Assurance Project Manager (Appendix 17AA, Part II, Subsection 1.2.3.2.1.1).

13AA.1.9 Management and Review of Construction Activities

Overall management

~~Management~~ and responsibility for construction activities is assigned to the ~~EPC executive. The EPC executive~~ is accountable to the Sr. VP, Major Enterprise Projects. See Figure 13.1-201, Construction Organization.

site executive. The site executive

Monitoring and review of construction activities by utility personnel is a continuous process at the plant site. Contractor performance is monitored to provide objective data to utility management in order to identify problems early and develop solutions. Monitoring of construction activities verifies that the contractors are in compliance with contractual obligations for quality, schedule, and cost. To maintain independence

Major Enterprise Projects

EPC

from the construction organization, the oversight organization has functional access to the Senior VP, Major Enterprise Projects.

operating and technical support

Monitoring and review of construction activities is divided functionally across the various disciplines of ~~the utility construction staff~~, i.e. electrical, mechanical, instrument and control, etc., and tracked by schedule based on system and major plant components/areas.

EPC

operating and technical support

After each system is turned over to ~~plant~~ staff the ~~construction~~ organization relinquishes responsibility for that system. At that time the ~~construction~~ organization will be responsible for completion of construction activities as directed by ~~plant~~ staff and available to provide support for start-up testing as necessary.

13AA.2 **Preoperational Activities**

operating and technical support

This section describes the activities required to transition the unit from the construction phase to the operational phase. These activities include turnover of systems from construction, preoperational testing, schedule management, test procedure development, fuel load, integrated startup testing, and turnover of systems to ~~plant~~ staff.

Insert 5

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The plant manager, with the aid of those managers that report to the plant manager (see Figure 13.1-204), the technical support staff (see Figure 13.1-205), and the aid of the manager in charge of the Startup group (see Figure 14AA-201), is responsible for the activities related to the transition from the construction phase to the operational phase. These activities include preoperational testing, schedule management, procedure development for tests, fuel load, integrated startup testing, and turnover of systems to the operations staff.

During construction initial testing, the Engineering, Procurement and Construction (EPC) contractor is responsible for equipment maintenance. To ensure equipment operability and reliability, plant maintenance programs such as preventative and corrective maintenance are developed prior to system turnover and become effective as each system is turned over from the EPC contractor to the operating and technical staff with approved administrative procedures under the direction of the manager in charge of maintenance, the Engineering Director, and work control.

technology

technology

Human Factors Engineering (HFE)

13AA.2.1 Development ~~of Human~~ Factors Engineering Design Objectives and Design ~~Phase~~ Review of Proposed Control Room Layouts

~~HFE~~ design objectives are initially developed by the reactor vendor in accordance with DCD Chapter 18. As a collaborative team, personnel from the reactor vendor design staff and personnel, including licensed operators, engineers, and instrumentation and control technicians from owner and other organizations in the nuclear industry, assess the design of the control room and man-machine interfaces to attain safe and efficient operation of the plant. See DCD Section 18.2 for additional details of HFE program management.

Engineering Director

Modifications to the certified design of the control room or man-machine interface described in the DCD are reviewed per engineering procedures, as required by DCD Section 18.2, to evaluate the impact to plant safety. The ~~manager in charge of engineering~~ is responsible for the HFE design process and for the design commitment to HFE during construction and throughout the life of the plant. The HFE program is established in accordance with the description and commitments in DCD Chapter 18.

13AA.2.2 Preoperational and Startup Testing

necessary to transition the unit from the construction phase to the operational phase.

Functional managers reporting to the plant manager are assigned responsibility for organizing and developing the preoperational testing and startup testing organizations. These organizations prepare procedures and schedules and conduct preoperational and startup testing. The preoperational and startup testing organizations are staffed by testing engineers, procedure writers, and planner/schedulers. The qualification requirements of testing engineers in the preoperational and startup testing organizations meet those established in ANSI/ANS-3.1 (Reference 13.1-201).

Test engineers are responsible for integrated testing of systems to prove functionality of system design requirements. They provide guidance and supervision to procedure writers and communicate closely with operations personnel and other supporting staff to facilitate safe and efficient performance of preoperational and startup tests. The scope of testing to be accomplished is presented in Chapter 14. As systems are turned over from the constructor they are tested by component then by integrated system preoperational test. Sufficient numbers of personnel are assigned to perform preoperational and startup testing to facilitate safe and efficient implementation of the testing program. Plant-specific technology

training provides instruction on the administrative controls of the test program. The startup test program provides data and experience useful during the operational phase.

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During the preoperational and startup testing phases, the constructor and reactor vendor staff support, as necessary, the testing performed by the nuclear plant preoperational and startup testing staffs. The functional managers in charge of preoperational and startup testing are assisted by other station organizations including operations, plant maintenance, and engineering. These assisting organizations provide support in developing test procedures, conducting the test program, and in reviewing test results.

Procedures are written to describe organizational responsibilities and interfaces between staff, constructor, and reactor vendor, and to establish direction in writing, reviewing, and performing tests. The construction organization, depicted in Figure 13.1-201, includes the preoperational and startup testing functional groups.

13AA.2.3 Development and Implementation of Staff Recruiting and Training Programs

Staffing plans are developed with input from the reactor vendor for safe operation of the plant as determined by HFE. See DCD Section 18.6. These plans are developed under the direction and guidance of the Senior Vice President, Major Enterprise Projects.**[START COM 13AA-001]** Staffing plans will be completed and manager level positions filled prior to start of preoperational testing. Personnel selected to be licensed reactor operators and senior reactor operators along with other staff necessary to support the safe operation of the plant are hired with sufficient time available to complete appropriate training programs and become qualified and licensed (if required) prior to fuel being loaded in the reactor vessel. See Figure 13.1-202 for hiring and training requirements for operator and technical staff relative to fuel load. **[END COM 13AA-001]**

Because of the dynamic nature of the staffing plans and changes that occur over time, it is expected that specific numbers of personnel on site will change. Table 13.1-201 includes the initial estimated number of staff for selected positions that will be filled at the time of initial fuel load. Recruiting of personnel to fill positions is the shared responsibility of the manager in charge of human resources and the various heads of departments. The training program is described in Section 13.2.

13AA.2.4 Transition to Operating Phase

The Senior Vice President, Major Enterprise Projects is responsible for developing and implementing a plan for the organizational transition from the construction phase to the operating phase. The plan is fully iImplemented and transition completed prior to commencement of commercial operations with operational responsibility then fully under the directiion of the Fermi 3 Site Executive.

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(see Appendix 17AA Part II, Subsection 1.2.2.1)

Appendix 13BB Training Program

STD SUP 13.2-1
STD COL 13.2-1-A
STD COL 13.2-2-A

NEI 06-13A (Reference 13BB-201), Technical Report on a Template for an Industry Training Program Description, which is under review by the NRC staff, is incorporated by reference.

13.BB References

New Paragraphs:
As the construction of systems, or portions thereof, are completed, control and authority, including oversight, configuration and operations, is transferred from the contractor to the cognizant department in the site organization (see Subsection 13AA.2).
During the transition, responsibilities will be clearly defined in instructions and procedures to ensure appropriate authority is maintained for each system, structure and component.
It is anticipated that even after fuel load, construction activities will be ongoing. Those positions required to support these activities will retain their applicable construction or preoperational responsibilities until it is deemed that they are no longer necessary.

14AA.1.2 Phases of the Initial Test Program

The ITP (per RG 1.68) has the following five phases:

1. Preoperational Testing
2. Initial Fuel Loading and Pre-Criticality Tests
3. Initial Criticality
4. Low-Power Tests
5. Power Ascension Tests

These phases are described in further detail in DCD Section 14.2 and in Section 14.2, and are referred to collectively as Startup Tests.

14AA.1.3 Objectives of Preoperational and Startup Testing

Objectives of Preoperational Testing are in DCD Section 14.2.1.2. Objectives of Startup Testing are in DCD Section 14.2.1.3.

14AA.1.4 Testing of First of a Kind Design Features

First of a kind (FOAK) testing may occur in any of the phases depending on the nature of the testing and required sequencing of the tests. When testing FOAK design features, applicable operating experience from previous test performance on other ESBWR plants is reviewed where available and the ITP modified as needed based on those lessons learned.

14AA.1.5 Credit for Previously Performed Testing of First of a Kind Design Features

In some cases, FOAK testing is required only for the first of a new designor for the first few plants of a standard design. In such cases, credit may be taken for the previously performed tests. A discussion is included in the startup test reports of the results of those tests that are credited.

14AA.2 Organization and Staffing

Administration of the ITP is governed by procedures in the SAM.

14AA.2.1 Organizational Description

operating and technical support

The ~~Plant Staff~~ organization is described in Section 13.1. General preoperational responsibilities and a description of preoperational and startup testing are provided in Appendix 13AA.2. DCD Section 14.2.1.4 provides a description of the Startup Group organization.

the operating

technical support staff, EPC personnel including the reactor technology vendor and A/E staff,

The Startup Group has two internal groups: the Preoperational Test Group, ~~which is~~ responsible for conducting and documenting preoperational tests; and the ~~Startup~~ Test Group, which is responsible for conducting and documenting initial startup testing. ~~Both~~ groups consist of personnel drawn from various organizations such as ~~plant~~ staff, ~~construction personnel, GEH~~, and other contractors, vendors and consultants.

The manager in charge of the Startup Group reports to the plant manager and has the qualifications of Preoperational Testing Supervisor as set forth in Table 13.1-201.

The Preoperational Test Group consists of Preoperational Testing Supervisors (i.e., NSSS, BOP, Electrical, and others, as required), each of whom reports to the manager in charge of the Startup Group. Preoperational Testing Engineers are assigned to this group and report to one of the Preoperational Testing Supervisors. Qualifications of Preoperational Testing Supervisors and Preoperational Testing Engineers are set forth in Table 13.1-201.

The Startup Test Group consists of Startup Testing Supervisors who report to the manager in charge of the Startup Group. Startup Test Engineers are assigned to this group and report directly to one of the Startup Testing Supervisors. Qualifications of Startup Testing Supervisors and Startup Test Engineers are set forth in Table 13.1-201. Figure 14AA-201 illustrates the organizational structure of the Startup Group.

14AA.2.2 **Responsibilities**

The manager in charge of Operations coordinates with the manager in charge of the Startup Group during the ITP to provide operations personnel to coordinate, support, and participate in preoperational testing. The manager in charge of Operations is a voting member of the Joint Test Group (JTG) and the Independent Review Body (IRB). The manager in charge of Operations is responsible for safe operation of the plant and ensuring tests are performed efficiently and effectively

<new bullet> Establishing and maintaining the startup group measuring at test equipment (M&TE) program required by Appendix 17AA, Part II, Section 12.

14AA.2.2.1 **Startup Group Manager**

The manager in charge of the Startup Group is responsible for:

- Staffing within the Startup Group.
- Developing procedures associated with ITP.
- Acting as Chairman of the JTG.
- Acting as an advisor to the IRB for all matters associated with startup testing.
- Managing contracts associated with the ITP.
- Coordinating with station and construction department heads for assignment of staff personnel to accomplish the test program objectives.

Reactor Technology Vendor

reactor technology vendor

reactor technology vendor

14AA.2.2.2 **~~GEH~~ Resident Site Manager**

~~The~~ ~~GEH~~ resident site manager is responsible for technical direction during the ITP. Qualifications of the ~~GEH~~ resident site manager are equivalent to the qualifications described in ANSI/ANS-3.1-1993 for a Preoperational Testing Supervisor. Specific responsibilities are:

- Acting as liaison with ~~GEH~~ on testing matters involving ~~GEH~~-supplied equipment.
- Reviewing preoperational and startup test procedures, with emphasis on the ~~GEH~~ Nuclear Steam Supply System (NSSS).
- Assisting in data reduction, analysis, and evaluation for completed tests.
- Acting as a voting member of JTG.
- Providing administrative support and supervision to ~~GEH~~ onsite personnel involved in the test program.

the reactor technology vendor

reactor technology vendor

reactor technology vendor

reactor technology vendor

14AA.2.2.3 **Vendor Site Representative**

A vendor site representative is responsible for technical direction during the preoperational phase of the test program. This position is filled as needed based on the scope of non-~~GEH~~ supplied equipment that requires preoperational or startup testing. Specific responsibilities are:

- Reviewing, approving and tracking document changes (including drawings, vendor tech manuals, procedures, design changes, etc.).
- Verifying that the test schedules are up to date with regard to latest testing results.

reactor technology vendor

- Processing final test packages through review and approval by the IRB.

14AA.2.2.10 **Independent Review Body**

Upon initial fuel load, the IRB assumes responsibility for tasks previously assigned to the JTG. The IRB is responsible for review of all procedures that require a regulatory evaluation under 10 CFR 50.59 and 10 CFR 72.48, as well as all tests and modifications that affect nuclear safety. The IRB is responsible for review of all startup test procedures.The organizational structure, functions, and responsibilities of IRB are described in Appendix 17AA. During the startup test phase, the IRB is advised by the manager in charge of the Startup Group and the ~~GEH~~ resident site manager. The IRB may be addressed by other titles such as Plant Operations Review Committee (PORC), On-site Safety Review Committee, or Plant Safety Review Committee (PSRC).

<indent> <bullet> Operating and technical support

14AA.2.3 **Operating and Technical Staff Participation**

~~Operating and technical s~~taff qualifications and experience requirements [S] are:

~~Plant~~ staff qualification and experience requirements are in Chapter 13 and in this appendix.

EPC contractor

EPC contractor

- Contractor qualification and experience requirements are in this appendix and in approved contractor procedures.
- Vendor staff qualification and experience requirements are in this appendix and in approved vendor procedures.
- ~~Architect Engineer~~ staff qualification and experience requirements are in this appendix and in approved ~~Architect Engineer~~ procedures.

Operating and technical support

Operating and technical support

~~Plant~~ staff participates in all phases of the ITP. ~~Plant staff groups~~ that participate include but are not limited to: ~~Quality~~ Assurance staff, Quality Control staff, ~~Operations~~ staff, Maintenance staff, Engineering staff, ~~Planning~~, Scheduling and Outage planning staff, and Work Management staff, including work planners and schedulers. Operations staff participates in preoperational testing as part of gaining experience as described in Appendix 13BB. Refer to Figure 14AA-201 for identification of organizations that have one or more participants in the ITP.

14AA.2.4 Conflict of Interest

Members of the Startup Group responsible for formulating and conducting preoperational and startup tests are not the same individuals who designed or are responsible for satisfactory performance of the systems or design features being tested. This does not preclude members of the design organizations from participating in test activities.

14AA.2.5 Training Requirements

operating and technical support

Training on the overall test program is conducted prior to scheduled preoperational and initial startup testing and as new employees are added to the test groups. A training program for each functional group in the organization is developed, with regard to the scheduled preoperational and startup testing, to ensure that the necessary plant staff is ready for commencement of the ITP. Additional discussion on staff training is found in Section 13.2, Appendix 13AA.2, and Appendix 13BB, and Figure 13.1-202. The training program includes:

- Systems to be tested.
- Training by selected major equipment vendors (e.g., turbine, plant control).
- A review of test program administration.
- Content of test procedures, including acceptance criteria review.
- Test sequence.
- Test conduct and closure.

Specific Just-In-Time (JIT) training is conducted for operating crews and other personnel conducting certain startup tests. This JIT training may involve simulator training. Criteria to be considered when determining if JIT is used for a test include complexity of the test and plant response,such as tests that result in plant trips or other transients, or where theymay occur. Accredited training program procedures describe the process for determining training topics to be conducted. The intention is to be aswell prepared as possible to operate the plant safely.

The reactor technology vendor

discrepancies, ~~exceptions,~~ nonconformances and failures (collectively known as test exceptions) identified in the ITP. The corrective action documentation becomes part of the test documentation. ~~GEH~~ and/or other design organizations participate in the resolution of design-related problems that result in, or contribute to, a failure to meet test acceptance criteria.

reactor technology vendor resident site manager

The plant manager approves proceeding from one test phase to the next during the ITP. Approvals are documented in an overall ITP governance document.

operating or technical support

Administrative procedures detail the test documentation review and approval. Review and approval of test documentation includes the test engineer, testing supervisor, Startup Group manager, ~~GEH site representative~~ or appropriate vendor, and JTG or IRB. Final approval is by the plant manager. Plant readiness reviews are conducted to assure that the ~~plant~~ staff and equipment are ready to proceed to the next test phase or plateau.

operating or technical support

14AA.4.3 Work Control

The Startup Group is responsible for preparing work requests when Construction organization assistance is required. Work requests are issued in accordance with ~~a~~ site-specific procedure governing the work management process. The ~~plant~~ staff, upon identifying a need for Construction organization assistance, coordinates their requirements through the appropriate Startup Test Engineer.

Activities requiring Construction organization work efforts are performed under the plant tagging procedures. Tagging requests are governed by a site-specific procedure for equipment clearance. Tagging procedures shall be used for protection of personnel and equipment and for jurisdictional or custodial conditions that have been turned over in accordance with the turnover procedure.

The Startup Group is responsible for supervising minor repairs and modifications, changing equipment settings, and disconnecting and reconnecting electrical terminations as stipulated in a specific test procedure. Startup Test Engineers may perform independent verification of changes made in accordance with approved test procedures.

14AA.4.4 **Measuring and Test Equipment (M&TE)**

During the preoperational test program, as well as the startup test program, most activities that lead to plant commercial operation involve design value verifications. M&TE used during these activities are properly controlled, calibrated, and adjusted at specified intervals to maintain accuracy within necessary limits. M&TE is governed by a site-specific procedure for control of M&TE. M&TE includes portable tools, gauges, instruments, and other measuring and testing devices not permanently installed, for example, startup test instruments prepared by the Preoperational Test Group as well as those provided by the Construction organization or by vendors.

operating

A calibration program is implemented. For standard M&TE equipment, calibration procedures are prepared for each type of M&TE calibrated onsite. Calibration intervals are established for each item of M&TE. However, if the calibration requirement of a particular piece of M&TE is beyond the capabilities or resources of the ~~plant~~ staff, this M&TE is sent to an offsite certified calibration or testing agency. If special test equipment is necessary only for the ITP, the responsible vendor provides this equipment with the appropriate calibration documentation.

14AA.4.5 **System Turnover**

During the construction phase, systems, subsystems, and equipment are completed and turned over in an orderly and well-coordinated manner. Guidelines are established to define the boundary and interface between related system/subsystem and are used to generate boundary scope documents; for example, marked-up piping and instrument diagrams (P&IDs), electrical schematic diagrams, for scheduling and subsequent development of component and system turnover packages. The system turnover process includes requirements for the following:

- Documenting inspections performed by the construction organization (e.g., highlighted drawings showing areas inspected).
- Documenting results of construction testing.
- Determining the construction-related inspections and tests that need to be completed before preoperational testing begins. Any open items are evaluated for acceptability of commencing preoperational testing.
- Developing and implementing plans for correcting adverse conditions and open items, and means for tracking such conditions and items.

- Reset high-flux trips, just prior to ascending to the next level, to a value no greater than 20 percent beyond the power of the next level unless Technical Specification limits are more restrictive.
- Perform general surveys of plant systems and equipment to confirm that they are operating within expected values.
- Check for unexpected radioactivity in process systems and effluents.
- Perform reactor coolant leak checks.
- Review the completed testing program at each plateau; perform preliminary evaluations, including extrapolation core performance parameters for the next power level; and obtain the required management approvals before ascending to the next power level or test condition.

Upon completion of a given test, a preliminary evaluation is performed that confirms acceptability for continued testing. Smaller transient changes are performed initially, gradually increasing to larger transient changes. Test results at lower powers are extrapolated to higher power levels to determine acceptability of performing the test at higher powers. This extrapolation is included in the analysis section of the lower power procedure.

operating and technical support staff

Surveillance test procedures may be used to document portions of tests, and ITP tests or portions of tests may be used to satisfy Technical Specifications surveillance requirements in accordance with administrative procedures. At Startup Test Program completion, a plant capacity warranty test is performed to satisfy the contract warranty and to confirm safe and stable plant operation.

EPC contractor

14AA.4.8 Conduct of Modifications during the Initial Test Program

Temporary modifications may be required to conduct certain tests. These modifications are documented in the test procedure. The test procedures contain restoration steps and retesting required to confirm satisfactory restoration to required configuration. Modifications may be performed by the ~~Construction organization~~ or the ~~plant staff processes~~ prior to NRC issuance of the 10 CFR 52.103(g) finding. If the modification invalidates a previously completed ITAAC, then that ITAAC is re-performed. Each modification is reviewed to determine the scope of post-modification testing that is to be performed. Testing is conducted and documented to ensure that preoperational testing and ITAAC remain valid. Modifications made following NRC issuance of the 10 CFR 52.103(g) finding are in accordance with plant ~~staff~~ processes and meet license conditions. Modifications that require change of ITAAC require NRC approval of the ITAAC change.

14AA.4.9 Conduct of Maintenance during the Initial Test Program

All corrective or preventive maintenance activities are reviewed to determine the scope of post-maintenance testing to be performed. Prior to NRC issuance of the 10 CFR 52.103(g) finding, post-maintenance testing is conducted and documented to ensure that associated preoperational testing and ITAAC remain valid. Maintenance performed following NRC issuance of the 10 CFR 52.103(g) finding is in accordance with plant ~~staff~~ processes and meets license conditions.

14AA4.10 Audits

A comprehensive system of planned and periodic audits is carried out to verify compliance with the ITP in accordance with the Quality Assurance Program Description. Follow-up actions, including re-audit of deficient areas, are taken where indicated.

technology

14AA.5 Review Evaluation and Approval of Test Results

14AA.5.1 Review and Approval Responsibilities

The reactor vendor is responsible for reviewing and approving the results of all tests of supplied equipment. Architect Engineer representatives review and approve the results of all tests of supplied equipment. Other ~~vendors' representatives~~ review and approve the results of all tests of supplied equipment. ~~Plant~~ staff review and approval responsibilities are in Appendix 14AA.2. Final approval of individual test completion is by the plant manager after approval by the JTG or IRB.

Operating and technical support

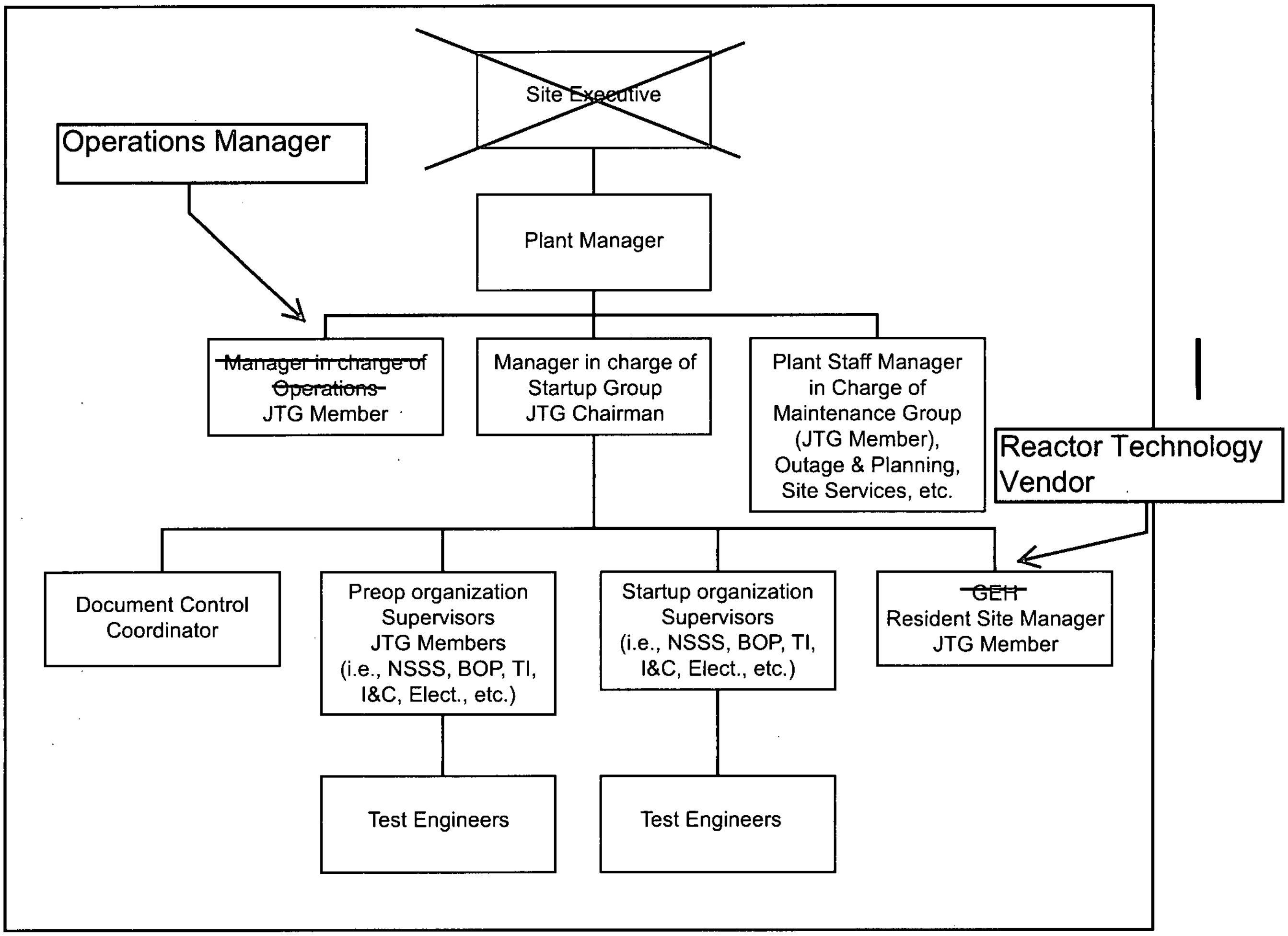
14AA.5.2 Technical Evaluation

Each completed test package is reviewed by technically qualified personnel to confirm satisfactory demonstration of plant, system or component performance and compliance with design and license criteria.

14AA.6 Test Records

Records retention requirements are in DCD Section 14.2.2.5 and in the Quality Assurance Program Description.

Figure 14AA-201 Preoperational and Startup Test Organization (Typical)



Attachment 14
NRC3-10-0016

Supplemental Response to RAI Letter No. 19
(eRAI Tracking Nos. 4069 and 4073)

RAI Question No. 02.04.03-2
RAI Question No. 02.04.03-3
RAI Question No. 02.04.05-5
RAI Question No. 02.04.05-6
RAI Question No. 02.04.05-7
RAI Question No. 02.04.05-8

NRC RAIs

Supplemental responses were requested for the following RAIs. To avoid unnecessary duplication and achieve as much simplification as possible, Detroit Edison has elected to address these RAIs with a single supplemental response.

02.04.03-2 - Probable Maximum Flood (PMF) on Streams and Rivers
02.04.03-3 - Probable Maximum Flood (PMF) on Streams and Rivers
02.04.05-5 - Probable Maximum Surge and Seiche Flooding
02.04.05-6 - Probable Maximum Surge and Seiche Flooding
02.04.05-7 - Probable Maximum Surge and Seiche Flooding
02.04.05-8 - Probable Maximum Surge and Seiche Flooding

Supplemental Response

The response to NRC RAI Letter No. 19, submitted in Detroit Edison letter NRC3-10-0007 (ML100330612), dated January 29, 2010, included supporting analysis associated with Fermi 3 COLA Part 2, FSAR, Section 2.4 Hydrology. Based on discussions with the NRC on February 25, 2010, it was determined that this analysis should be included in the FSAR; the proposed COLA markups are attached. Also included in the attached markups is the wave run-up figure provided in response to RAI 02.04.05-8; the attached figure correctly represents wave run-up height and elevation. The appropriate sections of the FSAR have been updated to reflect the analysis presented in the response to NRC RAI Letter No. 19.

Proposed COLA Revision

FSAR Sections 2.4.3 and 2.4.5 along with FSAR Figures 2.4-263, 2.4-264, and 2.4-265 have been updated to reflect the analysis as presented in response to NRC RAI Letter No. 19.

Markup of Detroit Edison COLA
(following 15 page(s))

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

lake level. This PMF evaluation and subsequent water level determination fulfills Alternative II.

Alternative I is fulfilled by evaluation of the 500-year flood for Swan Creek, which is estimated by the MDEQ to be 140 m^3/s (5,000 cfs) (Subsection 2.4.3). The Lake Erie elevation calculated for Alternative I was the 100-year lake level of 175.3 m (575.1 ft) NAVD 88 combined with the surge and seiche from the worst regional windstorm with wind wave activity, ~~predicted to be 1.2 m (4 ft) above the lake level (Table 2.4-222) by the U.S. Army Corps of Engineers. The calculated Lake Erie elevation with surge for Alternative I is therefore 177.5 m (579.1 ft) NAVD 88.~~

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Alternative III is fulfilled by analysis of the probable maximum surge and seiche with wind wave activity. Subsection 2.4.5 covers Probable Maximum Surge and Seiche Flooding in depth. The resulting maximum still-water elevation from Subsection 2.4.5 is 178.4 m (585.4 ft) NAVD 88. This is the Lake Erie water elevation calculated for Alternative III. The flow used under this scenario was the 25-year flood, estimated to be 90 m^3/s (3,100 cfs) from MDEQ predictions (Subsection 2.4.3).

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2.4.3.4 Probable Maximum Flood Flow

Q_{PMF} represents the Swan Creek Watershed discharge during the PMF calculated from a 72-hour PMP rainfall event. The 6-hour unit hydrograph and composite flood hydrograph of the Swan Creek Watershed are shown in Figure 2.4-219. Q_{PMF} is approximately 3,200 m^3/s (113,200 cfs). This is the estimated flow of Swan Creek as it enters Lake Erie.

There are no dams existing within the Swan Creek Watershed that would produce measurable effects on Lake Erie water levels. Subsection 2.4.4 discusses potential dam failures.

2.4.3.5 Water Level Determination

The water surface profiles for all three alternatives were determined by using the HEC-RAS Version 4.0 Beta 2008 software (Reference 2.4-242). A Digital Terrain Model (DTM) was developed using U.S. Quad Map data loaded in the ArcGIS 9 ArcMap Version 9.2 software. After locating the Swan Creek Watershed within the ArcGIS software, the HEC-GeoRAS Version 4 software (Reference 2.4-241) was used to survey the features in the watershed model in order to represent the most conservative PMP rainfall analysis and generate a water surface profile. Figure 2.4-218 shows the cross sections used within the

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The 100-year surge for the month of December was used to represent the seiche from the worst regional wind storm in this analysis. The calculated 100-year storm surges vary by month and range from 1.6 ft in August to 4.0 feet in December (Table 2.4-222). The exceedance probability of the combination of events used in the Fermi 3 analysis to satisfy Alternative I in ANSI/ANS-2.8-1992, Section 9.2.3.2, is 2×10^{-7} per year, which is less frequent than 1×10^{-6} cited in ANSI/ANS-2.8-1992, Section 9.2, as the bases for the event combinations. Using the 100-year storm surge of 4.0 feet, the predicted water surface elevation for Alternative I was 176.6 m (579.4 ft) NAVD88 (580.6 ft plant datum (PD)).

As reported in the Shore Protection Manual (Reference 2.4-249), the maximum recorded rise for Toledo was 1.9 m (6.3 ft). Because of differences in shoreline configuration and bathymetry, this same rise might not have occurred at the Fermi Site. However, if a seiche of 6.3 ft was used in the Alternative I analysis, the predicted water surface elevation would be approximately 177.3 m (581.7 ft) NAVD88 (582.9 ft PD).

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Figure 2.4-263 shows the still water elevations for all three alternatives. On Figure 2.4-263 the seiche height of 6.3 ft was used in place of the 100-year storm surge of 4.0 ft for Alternative I (identified as Alternative IA). Alternative III has the highest still water level of all alternatives evaluated. The other alternatives vary between 1.1 to 2.1 m (3.8 to 6.8 ft) less than Alternative III.

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projection to match the soundings coordinate system. Contours with depths equal to zero were selected to define the shore of the lake and the islands.

For wind set-up, the Bretschneider methods (Reference 2.4-257) were used to calculate wind stress. Wind stress was then used for wind set-up and storm surge. STWAVE was used to simulate wave generation and ultimately the wave height and period to be used in the ACES modeling software (Reference 2.4-256). The ACES model is an integrated collection of coastal engineering design and analysis software. It provides a comprehensive environment for applying a broad spectrum of coastal engineering technologies. These technologies include functional areas such as wave prediction, wave theory, wave transformation, structural processes, wave run-up, littoral processes, inlet processes and harbor design. The Linear Wave Theory application provides a simple estimate for wave shoaling and refraction using Snell's law with wave properties predicted by linear wave theory. The wave run-up application estimates wave run-up and overtopping on rough and smooth slope structures that are assumed to be impermeable.

Insert 4 here. Start new paragraph with next sentence.

Based on this methodology, the storm surge is calculated to be 3.14 m (10.3 ft). As discussed in Subsection 2.4.5.2.2.1, the 100-year lake level is 175.2 m (574.8 ft) IGLD 85, corresponding to 175.3 m (575.1 ft) NAVD 88. The calculated still-water level for the storm surge in addition to the 100-year level is 178.4 m (585.4 ft) NAVD 88, corresponding to 178.8 m (586.6 ft) plant grade datum. The plant grade elevation for the safety-related structures of Fermi 3 is 180.0 m (590.5 ft) plant grade datum. Thus, the still-water elevation is 1.3 m (3.9 ft) below plant grade. ESBWR DCD Table 2.0-1 specifies that the maximum flood level is at least 0.3 m (1 ft) below plant grade. Therefore, the Fermi 3 design satisfies the enveloping site parameter in the DCD.

2.4.5.2.2.3 **Seiche**

Seiches are standing waves of relatively long periods that occur in lakes and other water bodies. Lake Erie is subject to occasional seiches of irregular amount and duration, which sometimes result from a sudden change, or a series of intermittent periodic changes, in atmospheric pressure or wind velocity. The maximum deviations from mean lake levels at Toledo were reported in the U.S. Army Corps of Engineers Shore Protection Manual (Reference 2.4-249). The maximum recorded

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The Coastal Engineering Manual (Reference 2.4-250) does not recommend any specific methods for calculating storm surge. The Bretschneider method was selected because it was considered to be the most appropriate method for this location. Two other methods were considered for the analysis. The Zeider Zee formula was not used in the analysis because it was developed for fjords, which are long, narrow and deeper than Lake Erie. The Sibul method was considered but not used because the wind set-up predicted by the Sibul method was significantly smaller than that of the Bretschneider method, therefore the Bretschneider method was more conservative.

The Bretschneider method is appropriate for lakes and reservoirs that are both regular and somewhat irregular in shape. The method can be improved for lakes with varying depths by segmenting the lake and making calculations for each segment, which was done in the analysis. The key parameters that affect storm surge are the fetch length, water depth, wind speed, and coefficients used to calculate wind stress and bottom stress. The Bretschneider method uses straight line fetches, therefore the longest straight line fetch distance was used in the calculations. This distance was calculated to be 154,781 m. The fetch length was divided into ten segments and the average depth within each segment was calculated. The average depths ranged from 8.7 m (closest to shore) to 23.2 m, with an overall average depth of 16.2 m

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To verify that the wind set-up predicted by the Bretschneider method was conservative and reasonable, the predicted value was compared to measured storm surges in Lake Erie. According to the Corps of Engineers Detroit District, the 100-yr storm surge for December at the Fermi site is 3.9 ft (Reference 2.4-245). In addition, according to the NOAA website (Reference 2.4-228), the maximum water level during the period of record was 576.22 ft (IGLD 85) or 576.48 ft (NAVD 88). This was recorded on April 9, 1998 at 1400. This value was 3 ft above the average monthly water level for April 1998. The maximum recorded water level is also 9 ft below the water level used in the flood calculations.

rise was 1.9 m (6.3 ft) and the maximum recorded fall was 2.7 m (8.9 ft) for the period from 1941 to 1981. The value of the rise is significantly less than the storm surge calculated using the Bretschneider methods, noted above.

Seiche events can also result in minimum lake water levels at the site. The Ultimate Heat Sink (UHS) for Fermi 3 is described in Subsection 9.2.5. The Isolation Condenser/Passive Containment Cooling System (IC/PCCS) pools contain a separate water supply in place during Fermi 3 operation for safety-related cooling in the event that use of the UHS is required. Lake Erie is not used for safety-related water withdrawal for Fermi 3. Therefore, a seiche event will not affect a safety-related water supply for Fermi 3.

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2.4.5.3 Wave Action

Wave run-up is evaluated to determine the wind-induced wave run-up under PMWS winds. Wave run-up and potential overtopping rates were calculated using the ACES model (Reference 2.4-256). Results of the STWAVE model were used to define wave characteristics (wave height and period) necessary as inputs to the ACES model. Other required inputs are characteristics of the shoreline protection, including slopes and material used (e.g., rip-rap, rubble, tetrapods). Calculations were made assuming irregular waves. In calculating overtopping rates, the relative heights of the embankment to the still-water level were important. For these calculations, it was assumed the still-water level was a combination of the 100-year water level plus increases in water level due to surge and seiche.

The potential for wave action to cause flooding of the safety-related features was considered for all alternatives. The approach was to first examine the effects of waves for the worst case scenario which was Alternative III. This alternative includes the 100-year level of the waterbody and probable maximum surge with wind wave activity.

2.4.5.3.1 Wave Run-Up Analysis Approach

The wave run-up models were used to calculate the run-up that occurs when waves encounter a shoreline or embankment. Overtopping rates were also calculated in this determination. The required inputs include wave type, breaking criteria, wave height, wave period, structure slope, structure height, slope type, and roughness coefficient. The cases modeled were for a flooded berm. Roughness coefficients consistent with rip-rap were used for the cases with rough surfaces.

Wave transmission and wave run-up modules in the ACES model were derived from physical model studies originally conducted for specific structures and wave climates (Reference 2.4-256). General assumptions for the wave run-up on an impermeable embankment are:

2.4.5.2.2.4 Surge Due to Moving Squall Line

According to the ANSI/ANS-2.8-1992 standards, Section 7.2.3.1, "A moving squall line should be considered for the locations along Lake Michigan where significant surges have been observed because of such a meteorological event. The possible region of occurrence includes others of the Great Lakes". The standard further defines the conditions to be used in the analysis which include a pressure jump of 8 mbar within a 10 nautical mile width of the squall lines with a 65 knot wind. In addition, the squall line should move at the resonant speed of the surge.

In the Great Lakes area, most of the analyses of storm surges due to moving squall lines have been in Lake Michigan. As reported by Platzman (Reference 2.4-315), most of the moving squall lines in this region move in a northwest to southeast direction. The effect of the pressure gradient and wind stress acting on the water surface produces a surface disturbance that can cause surges at the shoreline. The effect is greatest when the propagation of the squall line is approximately equal to the speed of waves in the lake. The speed of waves in the lake is dependent on the water depth.

Fast moving squall lines have on several occasions produced storm surges in the range of 6 to 8 ft in Lake Michigan. These same storms would not produce significant storm surges in Lake Erie because the storm would move over the water surface too quickly. Reference 2.4-316 reported on storm surges that affected Lake Huron and Lake Erie in 1952 that were associated with a moving squall line. The storm traveled in a southeasterly direction over Lake Erie with a propagation speed of about 27 mph, approximately the resonant speed of the surge. A storm surge of less than 2 ft was observed in Cleveland. For a pressure jump of 8 mbar, the storm surge would have been about 4 ft.

The Fermi site is sheltered from the predominant direction of squalls moving through this region of the Great Lakes. To generate the greatest storm surge, the squall line would have to move in a southeast to northwest direction, opposite to the direction in which they are observed to travel. Based on historical data and analyses of storm surges conducted for Great Lakes areas, it can be concluded that a storm surge from the prescribed conditions could produce a water level rise of up to a few feet. As discussed previously in Section 2.4.5.2.2.2, the surge used in the flood analysis is 3.14 m (10.3 ft). Therefore, the surge from a moving squall line would be much less than the condition used in the analysis.

- Waves are monochromatic, normally incident to the structure, and unbroken in the vicinity of the structure toe.
- Waves are specified at the structure location.
- All structure types are considered to be impermeable.
- For sloped structures the crest of the structure must be above the still-water level.
- For vertical and composite structures, partial and complete submersion for the structure is considered.
- Run-up estimates on sloped structures require the assumption of infinite structure height and a simple plane slope.
- The expressions for the transmission by overtopping use the actual finite structure height.

2.4.5.3.2 **Wave Run-Up Results**

2.4.5.3.2.1 **Description of Nearshore and Shallow Onshore Areas**

Profiles have been developed to describe the nearshore and shallow onshore areas. For purposes of the wave transmission and wave run-up analysis the following areas were defined. Slopes are reported as Horizontal: Vertical (H: V).

These areas are shown on Figure 2.4-263.

- Nearshore – the area from 1.0 m (3.3 ft) depth Mean Low Water (MLW) to 0 m (0 ft) depth MLW. This area is between the point used to describe the waves at the shore (from STWAVE model) to the base of the seawall. The area is about 660 m (2,160 ft) to 1,000 m (3,280 ft) wide with a slope of about 200 H: 1 V.
- Seawall – the area of onshore protection from an elevation of 174 m (571 ft) to 178 m (583 ft) plant grade datum, with a slope of 3H: 1V to 2H: 1V.
- Onshore - the area immediately behind the seawall. This area is approximately flat with a width of about 300 m (1,000 ft) at elevation 178 m (583 ft) plant grade datum.
- Berm – area between the onshore flat area, at elevation 178 m (583 ft) plant grade datum, and the project site, at elevation 180.0 m (590.5 ft) plant grade datum or 179.6 m (589.3 ft) NAVD 88. This berm area has a slope of about 12.5 H: 1V with smooth slopes.

Figure 2.4-264 provides the contours of the wave height distribution overlaid on the bathymetric map of Lake Erie from NOAA (Reference 2.4-317). The wave height contours were prepared using the results from the STWAVE analysis. Wave heights are in meters and the contours have 0.1 meter accuracy.

2.4.5.3.2.2 **Results from the STWAVE Model**

Wave characteristics were obtained from the STWAVE model. Several points that were closest to shore were examined to determine the highest waves generated. The point used to represent the waves reaching the shore was located about 61.0 m (200 ft) from shore at a depth of 1.0 m (3.3 ft) MLW. The result of the modeling showed that the highest waves generated (H_{mo}) were 3.77 m (12.37 ft) high with a peak spectral period (Tp) of 11.1 seconds.

As waves move across the nearshore area they will shoal resulting in slightly higher waves. At the end of this area the wave height would be 3.92 m (12.86 ft). This wave height was determined using the wave transmission module of the ACES model. The ACES model also showed that soon after reaching the seawall the wave would break.

It is possible that the wave period would be reduced; however, according to the Coastal Engineering Manual (Reference 2.4-250) there are no widely accepted theoretical methods for determining changes in wave period. Therefore, for this analysis the wave period was assumed to remain unchanged at 11.1 seconds.

2.4.5.3.2.3 **Breaking Wave Characteristics**

Maximum wave heights are constrained by the relative depth (ratio of wave height to water depth) and by wave steepness (ratio of wave height to wave length). Breaking wave heights were calculated according to procedures in Reference 2.4-250. Specifically equation II-4-11, Equation 4, was used to calculate the zero-moment wave height ($H_{mo,b}$) at the time of breaking, using the modified 1951 Miche criterion, which is the same equation used by the STWAVE model. This equation represents both depth and steepness-induced wave breaking. Although not exactly equivalent in definition, the zero-moment wave height is generally considered to be equivalent to the significant wave height. The equation used is:

$$H_{mo,b} = 0.1\ L \tanh(kd) \qquad \text{[Eq. 4]}$$

where:

k = wave number defined as $2\pi/L$
d = water depth

As waves move onshore, the wavelength decreases; thus, the first step is to calculate the appropriate wave length according to Equation 5:

$$L = g/2\pi * T^2 \tanh(2\pi d/L) \quad \text{[Eq. 5]}$$

Because L is on both sides of the equation, this equation must be solved through an iterative process.

Wavelengths associated with various points in the lake are shown in Table 2.4-223. Breaking wave heights at the toe of the seawall and at the toe of the berm are shown in Table 2.4-224.

2.4.5.3.2.4 Wave Run-up and Overtopping Rates

Wave run-up on the slope to the Fermi 3 grade elevation of 178.0 m (590.5 ft) plant grade datum or 179.6 m (589.3 ft) NAVD 88 was analyzed to determine if waves could impact the unit. The wave characteristics calculated for the toe of the berm were used as inputs to the ACES model to calculate wave run-up and overtopping rates on the berm. Because the berm is onshore, it was simulated as a smooth slope. An example of the inputs and calculated outputs for the on site configuration are shown in Figure 2.4-230. The analysis of wave run-up determined that waves could not directly impact Fermi 3.

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2.4.5.4 Resonance

Resonance generated by waves can cause problems in enclosed water bodies, such as harbors and bays, when the period of oscillation of the water body is equal to the period of the incoming waves. However, the Fermi site is not located in an enclosed embayment. The full exposure to Lake Erie during PMWS conditions, plus the flat slopes surrounding the site area, results in a natural period of oscillation of the flooded area that is much greater than that of the incident shallow-water storm waves. Consequently, resonance is not a problem at the site during PMWS occurrence.

2.4.5.5 Sedimentation and Erosion

Fermi 3 does not rely on Lake Erie for a safety-related water source. Therefore, the loss of functionality of a safety-related water supply to Fermi 3 caused by blockages due to sediment deposition or erosion during a storm surge or seiche event is not a concern. The slope to Fermi 3 is appropriately designed to preclude significant erosion during the postulated storm surge.

Insert 6

Wave run-up for Alternative III is predicted to be 3.0 ft, or approximately 0.85 feet below the elevation of the Fermi 3 safety related structures. Wave run-up is shown on Figure 2.4-265. The vertical exaggeration on Figure 2.4-265 is approximately 5 to 1. For Alternative II the still water level at the site was calculated to be 578.6 ft NAVD88 or 579.8 ft PD. This elevation is about 3.2 ft below the elevation of the top of the seawall at the site. For this alternative, there would be water from the waves splashing up onto the onshore area behind the seawall. The still water level for Alternative IA would be 581.7 ft NAVD88 or 582.9 ft PD, which is just below the top of the seawall. A significant amount of water would wash onto the onshore area. The elevation of the safety related structures is 7.5 ft above the onshore area. Based on this information, it was concluded that wave activity would not have any impact on the safety related structures for any of the alternatives considered.

2.4-306 US Army Corps of Engineers Hydrologic Engineering Standard, "Probable Maximum Storm, HMR 51 User's Manual" March 1984.

2.4-307 US Department of Commerce Weather Bureau, Technical Paper No. 40, Rainfall Frequency Atlas of the United States for Duration from 30 minutes to 24 hours and return periods from 1 to 100 years. May 1961.

2.4-308 Corps of Engineers Ice Jam Database https://rgis.crrel.usace.army.mil/apex/f?p=273:3:1818914186479561, accessed September 2, 2009.

2.4-309 Federal Emergency Management Agency. Flood Insurance Study Monroe County, Michigan. April 20, 2000.

2.4-310 CorpsMap, National Inventory of Dams, https://nid.usace.army.mil, accessed September 2, 2009.

2.4-311 National Geophysical Data Center Historical Tsunami Record, National Oceanic and Atmospheric Administration, Website: http:www.ngdc.noaa.gov/hazard/hazards.shtml

2.4-312 Prickett, T. A., 1965. Type-Curve solution to Aquifer Tests Under Water-Table Conditions. Ground Water, Vol. 3, No. 3, pp. 5-14.

2.4-313 Neuman, S. P., 1979. Perspective on "Delayed Yield". Water Resources Research, Vol. 15, pp. 899-908.

2.4-314 Moench, A. F., 1993. Computation of Type Curves for Flow to Partially Penetrating Wells in Water-Table Aquifers. Ground Water, Vol. 31, No. 6, pp. 966-971.

2.4-315 Platzman, G.W. "The Prediction of Surges in the Southern Basin of Lake Michigan. Part I. "The Dynamical Basis for Prediction," *Monthly Weather Review*, vol 93, No. 5, May 1965, pp. 275-281.

2.4-316 Donn, W.L., "The Great Lakes Storm Surge of May 5, 1952," *Journal of Geophysical Research*, vol 64, No. 2 Feb. 1959, pp. 191-198.

2.4-317 NOAA Great Lakes Environmental Research Laboratory, http://www.glerl.noaa.gov/data/char/bathymetry.html, accessed 21 January 2010.

Figure 2.4-263 Still Water Elevations

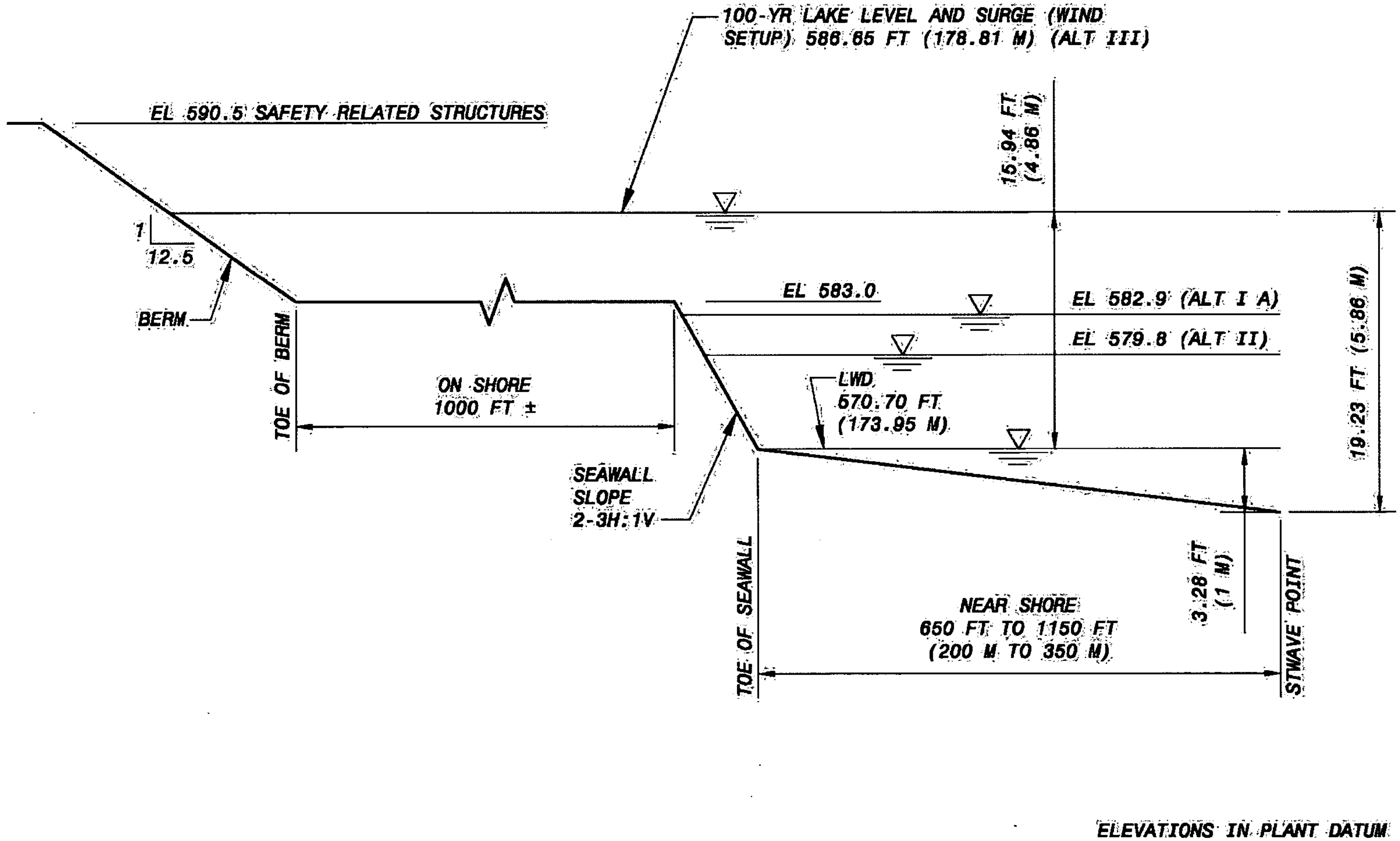


Figure 2.4-264 Wave Height and Bathymetry – Fermi Site

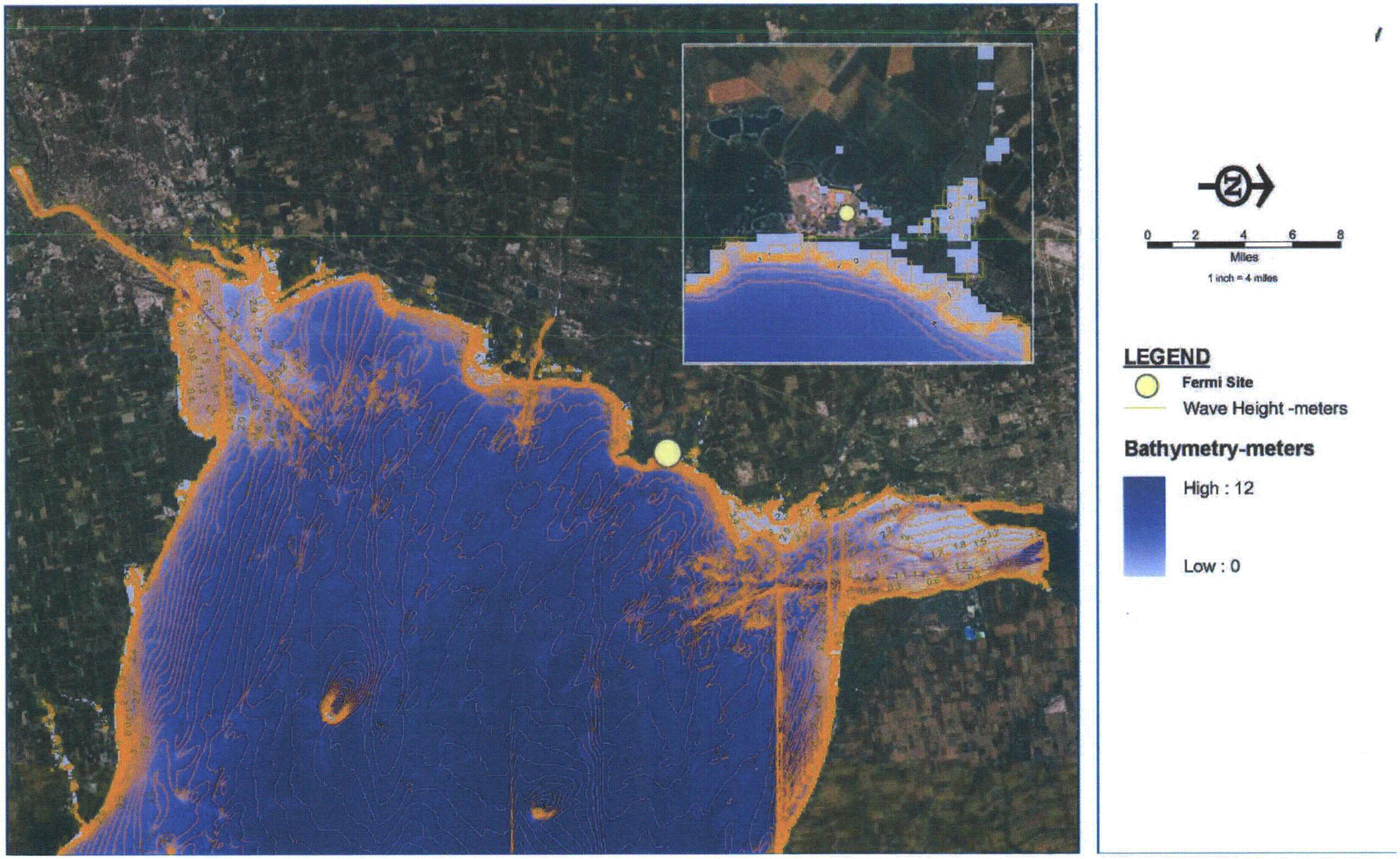
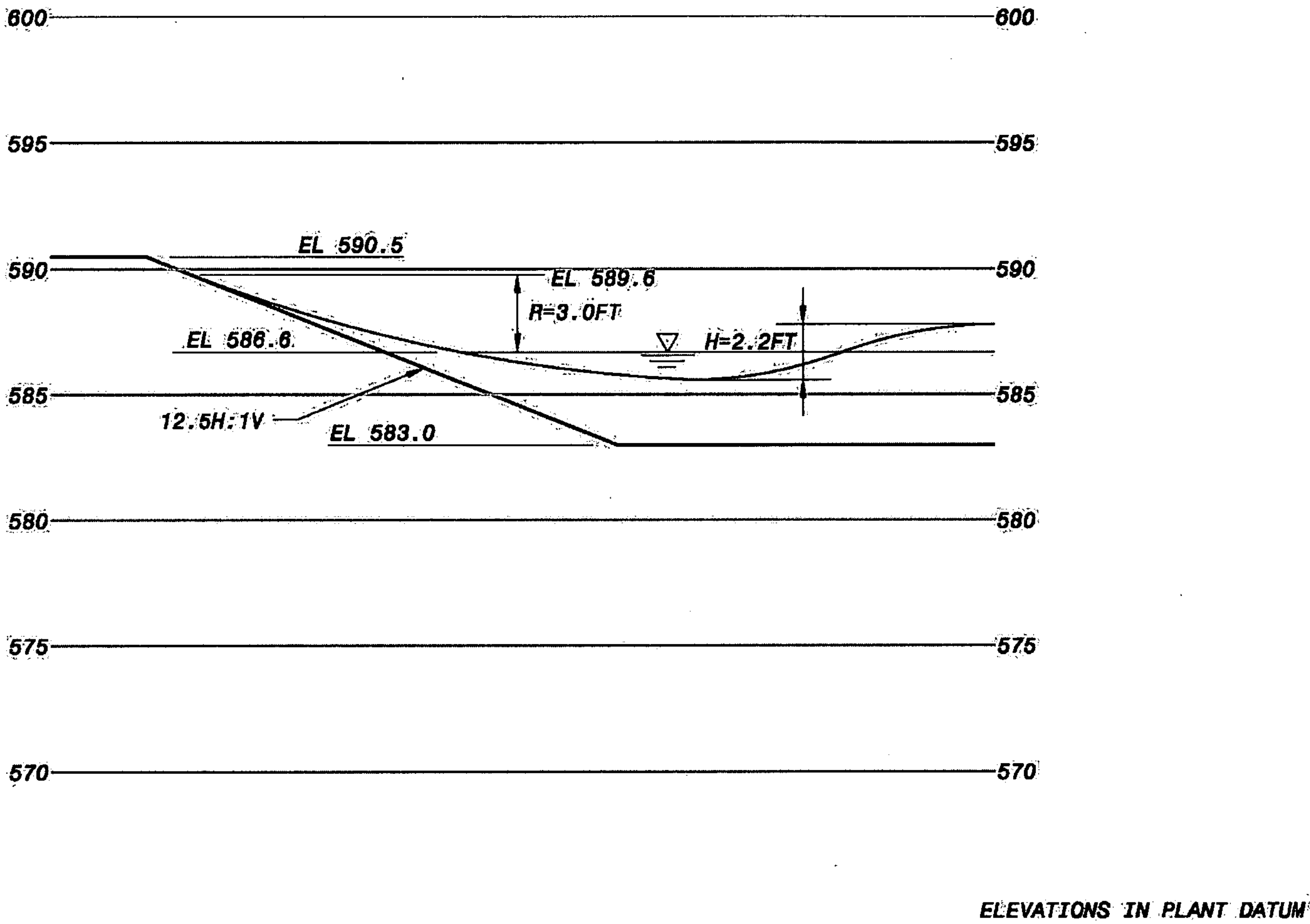


Figure 2.4-265 Wave Run-Up (Vertical exaggeration is approximately 5 to 1)



Attachment 15
NRC3-10-0016

1 CD Containing the Following

Filename: Fermi 3 ETE Rev 2.pdf, 18,379 KB

Sensitivity: Publically available
Description: "Fermi Nuclear Power Plant, Development of Evacuation Time Estimates", Rev.2, dated April, 2010