UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
DETROIT EDISON COMPANY	)	Docket No. 50-341
	)	
(Enrico Fermi Atomic Power Plant Unit 2)	)	

NRC STAFF PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

I. OPINION

A. BACKGROUND

This is a decision on an application from Detroit Edison Company (DECO), Northern Michigan Electric Cooperative, Inc. and Wolverine Electric Cooperative, Inc. (Applicants) for a license to operate a nuclear power plant. Detroit Edison Company, eighty percent owner of the unit, has sole responsibility for licensing and operation of the facility. The application requests an operating license for a boiling water nuclear reactor designated Enrico Fermi Atomic Power Plant, Unit 2 (Fermi 2) located on the western shore of Lake Erie in Frenchtown Township, Monroe County, Michigan.[1/] A permit to construct the nuclear

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1/ 40 Fed. Reg. 23122 (1975)

reactor was issued in 1972. The unit has the capacity to produce approximately 1,093 net megawatts of electrical power (MWe).

The application for license is contested by Citizens for Employment and Energy (CEE) which was admitted as a party to the proceeding by the Licensing Board[2/] as well as eight contentions.[3/] CEE withdrew five contentions at a prehearing conference held in July, 1981;[4/] summary disposition was granted for one remaining contention;[5/] and two contentions were the subject of a hearing held March 31 to April 2, 1982 in Monroe, Michigan. Several limited appearance statements were made by the public during this time. The two contentions concerned alleged inadequacies in the Applicants' quality assurance and quality control program resulting in defects in construction (Contention 4) and the feasibility of the evacuation route for nearby residents in case of an emergency at the plant. (Contention 8).

The decisional record of this proceeding consists of (a) the Commission's Notice of Hearing; (b) the pleadings filed by the parties; (c) the transcripts of the hearing, and (d) the exhibits received into evidence. This Board's jurisdiction is limited to findings of fact and conclusions of law concerning the matters in controversy among the parties to the proceeding. The Board raised no issues involving serious

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2/ The Atomic Safety and Licensing Board appointed to consider this matter was reconstituted by Notice of September 10, 1981.

3/ Prehearing Conference Order Ruling Upon Intervention Petitions, January 2, 1979; Board Order, March 21, 1979.

4/ Tr 192-196

5/ Memorandum and Order, January 27, 1982

safety, environmental or common defense and security matters under 10 C.F.R. § 2.760(a).

B. CONTENTIONS

1. Construction deficiencies

The matters raised in Contention 4 concerned security on site during construction [4(a)]; the Applicants' quality assurance (QA) inspection program, specifically pipe hangers and welds [4(b)]; QA records [4(c)]; replacement of the first general contractor [4(d)]; and two specific flaws in the plant's construction, namely (1) cracks in the concrete base slab of the reactor building and (2) hairline cracks in the dry well structural steel clip angles. All of these concerns were raised with the Commission's Office of Inspection and Enforcement (IE), Region III in 1979 by a member of CEE, a former ironworker at the Fermi 2 site during its construction, Mr. Frank Kuron. Four inspectors from Region III interviewed Mr. Kuron on two different occasions, regarding allegations that he had made during a December 1978 prehearing conference concerning construction deficiencies. These meetings with Mr. Kuron were extensive. The second meeting lasted nearly two days, and included a walking tour of the Fermi 2 facility without a DECO escort, during which Mr. Kuron was given an opportunity to identify any alleged construction deficiencies. Mr. Kuron agreed during the hearing that on this walking tour he was given access to every area of the plant that he desired, and that he had voiced all of the concerns raised in his written testimony to the IE investigators during the meetings. (Board Finding 3)

Staff witnesses testified that the results of this investigation are documented in IE Report No. 50-341/79-04. According to the IE investigation, Mr. Kuron's allegations were found to be either (1) unsubstantiated, (2) previously identified, (3) nonsafety related, or (4) matters subsequently inspected by IE and found to be resolved. (Board Findings 3, 4) Indeed, Mr. Kuron stated in his written testimony that the Applicants had implemented an adequate quality control program since the early stages of construction, and that the NRC had already ordered certain deficiencies to be corrected. (Tr.ff.367,pp.3,4) Mr. Kuron did not contest the conclusions of the Applicants or IE inspectors that the specific construction concerns raised in his allegations have been resolved. Against this background, the Board had little difficulty finding that the construction deficiency allegations raised by the Intervenor pose no remaining concerns regarding the adequacy of construction at Fermi 2. We now turn to the specific allegations raised by the Intervenor.

Construction Site Security and Sabotage

CEE claims that there was a general lack of security at the site during construction and that several fires and a great deal of theft occurred as well as a release of several hundred gallons of fuel oil.

However, the Board notes that the Commission's regulations do not require an applicant such as DECO, which is not yet licensed to possess or use formula quantities of strategic special nuclear material, to have in place a physical security protection system. (Board Finding 6) Nevertheless, Applicants have had uniformed security officers present on the plant site since early 1971 who patrolled the site and manned the gates, and increased the guard force and security measures as construction progressed.

(Board Finding 7) Applicants stated that tool thefts and vandalism on site have occurred but that no serious breach of site security had occurred. (Board Findings 6, 7)

This system controlled access and egress and provided fire and security patrols on a 24 hour basis. The various site inspections by IE indicate that construction has been performed satisfactorily. In addition, a comprehensive pre-operation test program will be conducted to demonstrate that all safety systems and components will meet design requirements, so that damage from vandalism or sabotage will be detected.

The Board finds that reasonable security measures to prevent intrusion by vandals have been in place at the plant site during construction. The Board finds, further, that no evidence of deliberate sabotage or unintentional injury to components has been shown and that there is reasonable assurance that the preoperational test procedures will detect any damage to safety systems or components. (Board Finding 7)

Quality Assurance: pipe hangers and welds

CEE admits that all deficiencies related to an allegation concerning the installation of pipe hangers have been corrected, and that all deficiencies in the area of quality assurance (QA) have been corrected. (Board Finding 8) However, Mr. Kuron claims that improper welds were done on nozzles on the main condenser in the turbine building, the main steamlines, the chemical cleaning and flushing system, and pipe whip restraints. In addition, he stated that he had reported to IE inspectors during the 1979 investigation that a problem had arisen concerning installation of a globe valve and associated piping, poor housekeeping in the dry well area, missing screws in the shielding panels, deterioration of

valves in storage, improper installation of concrete anchors, and voids in the sacrificial shield.

The Applicants testified that their QA program conforms to the requirements of 10 C.F.R. Part 50, Appendix B, Criterion X and that the QA/quality control (QA/QC) program has been implemented and inspected by NRC during construction of the plant. The Applicants explained that QA procedures are designed to discover deficiencies in construction such as defective welds.

An NRC inspector described an investigation by himself and two other NRC inspectors in 1979 in which all the matters listed in the CEE testimony were reviewed. All alleged deficiencies were found to be either nonsafety related, unsubstantiated, or corrected, with one exception. The sole item of noncompliance resulting from the investigation related to voids in the sacrificial shield. (Board Finding 8) Mr. Kuron, although not professing to have expertise or experience in grouting or otherwise repairing sacrificial shields, expressed concern over the ability to fill the voids in the shield. However, the IE inspectors who participated in the investigation of the shield testified that an adequate resolution of the problem was verified by IE in follow-up inspections. Applicants' witnesses testified that the entire shield had been reinspected, that the voids had been filled with grout, and that no more voids were detected in the sacrificial shield wall. (Board Finding 8)

The Board finds that all the construction deficiencies alleged by the Intervenor in its contention and direct testimony were thoroughly investigated in 1979 by a team of inspectors from IE Region III and were

either corrected or found to be nonsafety related or demonstrated to be erroneous.

QA Records

CEE also claims that Applicants have not maintained sufficient QA records and that two trailer loads of QA records were ordered destroyed by DECO officials after construction was suspended in 1974. CEE also alleges that a fire in a Fermi 2 construction site office building destroyed other QA records.

Applicants testified about procedures they used to assure maintenance and protection of QA records by safekeeping in fireproof facilities, microfilming, and separate storage of duplicate master copies, and that no permanent QA records were deliberately destroyed. Applicants explained that when construction was suspended, unnecessary papers on site such as personal files, letters, drawings were burned. As to the charge of accidental fire, the Applicants testified that a faulty gas heater in the piping contractor's office building (Building 45A) at the plant site caused a fire which damaged several QA records on the desk in the office. Some were salvaged, some were reconstructed from master files; some were replaced. The records were concerned with welding work in progress. (Board Finding 10)

An IE Region III inspector testified that he and other inspectors had investigated the allegation of deliberate and accidental destruction of QA records in 1979 and found no basis for the charge, except that a few welding records were lost in the site office. However, he stated that those records which could not be reconstructed from other records

or by personnel who had made the records, were replaced by reexamination of welds. This matter is also recorded in IE report 50-341/79-04.

The Board finds that no deliberate destruction of required QA records occurred at the plant site. We find that the site office fire did not result in significant loss of QA records, and that those records which were accidentally burned were satisfactorily replaced. (Board Finding 10)

Dismissal of General Contractor

CEE alleged that DECO terminated the first general contractor, the Ralph M. Parsons Company, due to the contractor's insistence on quality control which in turn caused delay in the construction schedule.

The Applicants testified that the Parsons Company was terminated after suspension of construction activities in 1974 because DECO wished to change its method of construction management so that it was not performing any direct work. Prior to that, two project managers from Parsons Company had been replaced at the request of DECO because of poor attendance on site and inability to maintain labor harmony.

IE inspectors testified that Mr. Kuron had not raised specific concerns regarding the Parsons Co. termination during the 1979 meetings. In response to Mr. Kuron's general concerns regarding the reasons for removing the contractor, however, the IE inspectors interviewed DECO management who indicated approval of Parsons Company QA and QC organizations. IE uncovered no information which would indicate that Parsons Co. employees were requested by the Applicants to sacrifice quality control in order to expedite the Fermi 2 construction schedule. Additionally, the inspectors pointed out that the site had

been inspected about 50 times by IE by 1979, and that no significant QA/QC problems had been discovered.

The Board finds no evidence that the original general contractor was replaced because of a dispute over QA/QC standards. Rather, the apparent reason for the change in contractors was unrelated to quality of construction, and there was no evidence that Parsons Co. had sacrificed quality control nor that it had been asked to do so by the Applicants. (Board Finding 11)

Cracks In Basemat And Structural Steel

The last allegation of construction deficiencies by CEE is that severe cracks developed in the (reactor building) concrete base mat; that the cracks were "patched;" and that hairline cracks occurred in the structural steel surrounding the dry well.

The Applicants' witnesses explained that in 1972, radial and circumferential hairline cracks were discovered on the surface of the reactor building's 4 feet thick concrete base slab and that small amounts of ground water were seeping into the reactor building floor. The slab was monitored until it was clear that no new cracks had appeared. Core samples showed the cracks ranged from 6 inches to 3 feet in depth. The NRC was advised of the cracking by Applicants. The cracks were repaired in 1973 with non-shrinking grout applied under high pressure. A final report to NRC regarding the event was submitted in 1974. The Applicants also testified that the cracking in the dry well structural steel referenced by CEE was limited to fine cracks in clip angles in the steel support framing for the slab over the torus. This was discovered and reported by IE in 1972. The Applicants replaced the installed clip angles where possible with those of different material and used a different welding method. Where

the angles were not accessible, Applicants installed beam seats at each angle location to assure that the load would be carried in the event of clip angle failure.

An NRC IE inspector testified that he had investigated the cracking in the reactor building base slab in 1979 and that DECO had previously reported the matter in accordance with 10 C.F.R. § 50.55(e). IE inspectors had concluded that the cracking had been remedied by grouting and that no further cracking had occurred. The IE witness testified that the cracking had been under surveillance for well over 5 years and that the problem was therefore satisfactorily resolved. NRC inspectors had also investigated the cracking of clip angles during the 1979 inspection and the method of Applicants' resolution of this matter. The inspectors found the remedy satisfactory.

The Board finds that the reactor building base slab cracking and cracking in the clip angles at the plant were matters satisfactorily resolved in 1979. (Board Findings 11, 12, 13)

CONCLUSION AS TO CONTENTION 4

The Board concludes that the evidence of record is uncontroverted that every matter raised in CEE Contention 4 was previously investigated by a team of inspectors from the Commission's Office of Inspection and Enforcement in 1979 and that all the concerns raised by CEE member, Mr. Kuron, have been resolved.

2. Evacuation Route For Nearby Residents

CEE contends that the only road (Pointe Aux Peaux Road) leading away from the nearby residential area (Stony Pointe) might be inadequate to

evacuate the residents in the event of accident at the Fermi 2 nuclear plant. The concern is that the road goes toward the plant from the Stony Pointe area before intersecting the nearest highway (Dixie Highway) so that in the event of evacuation, the nearby residents would travel nearer the source of radioactive emissions than their starting point before reaching the highway.

The Intervenor's testimony was limited to a repetition of the contention that travel toward the plant during evacuation could be dangerous.

The Applicants presented testimony which showed that the Pointe Aux Peaux Road has a capacity to handle 1200 vehicles per hour; that the population of the Stony Pointe area is about 1400 and that there are 738 automobiles in Stony Pointe. The evacuation time for the residents estimated by Applicants was a range of 1-3/4 to 2-1/2 hours depending on whether the evacuation occurred on a weekday or weekend. The Applicants testified that it is the responsibility of State and local officials to order evacuation of nearby residents after being informed by DECO of an emergency situation at the plant. The Applicants supplied the EPA protective action guides for reactor operators with their testimony to show the exposure ranges for certain recommended actions to protect the public. (Board Findings 15, 16, 23)

The Board was concerned that possible doses during an evacuation could affect the feasibility of an evacuation route, but the Staff witness from the Division of Emergency Preparedness testified that postulated or calculated doses were of use in determining the proper protective action for the public and not the adequacy of the road for

evacuation of nearby residents. The assessment of the road for evacuation rests on its capacity to handle the traffic necessary in a reasonable length of time if evacuation is ordered. Both the Staff witness and FEMA witness explained that evacuation is not always the best protective action for the public. It could be better to direct nearby residents to seek shelter in homes and offices. Evacuation could also be used as a precautionary measure, prior to any plant releases or after a radioactive plume has passed over the area where people are sheltered in buildings.

Both Staff's and Applicants' expert witnesses in traffic management agreed that the Pointe Aux Peaux road could accommodate the traffic from the Stony Pointe residential area in 1-1/2 - 2-1/2 hours. The evacuation time will be taken into consideration by State officials if an emergency arises. Additionally, the Staff's witnesses pointed out that residents would travel only about 1/4 mile closer to the plant while evacuating and the increase in dose received would be less than 10%. Finally, Staff witnesses testified that the Pointe Aux Peaux road compares favorably with other evacuation routes near nuclear plants and that it has no unusual traffic management problems. (Board Findings 20, 25, 29, 31)

The Board finds that the Pointe Aux Peaux road is adequate for use as an evacuation route for the nearby residents of the Stony Pointe area and the distance necessary to travel toward the plant is insignificant in terms of resultant increase in radiation that might be received by evacuees.

CONCLUSION AS TO CONTENTION 8

The Board concludes that the facts of record show that the Point Aux Peaux Road is a feasible evacuation route for the residents of Stoney

Pointe, and that the road's proximity to the plant poses no significant hazard.

The following findings of fact and conclusions of law are incorporated into the Opinion. In preparing its findings of fact and conclusions of law, the Board reviewed and considered the entire record and the findings of fact and conclusions of law proposed by the parties.[6/] The matters examined during the evidentiary hearing which are not discussed in this Opinion were considered by the Board and found either to be without merit or not to affect our decision. Proposed findings not incorporated directly or inferentially in this Initial Decision are rejected as unsupported by the record or as unnecessary to the decision.

Accordingly, for the foregoing reasons it is this date _____, 1982 ordered that the Director of Nuclear Reactor Regulation is authorized to issue an operating license to the Applicants for Enrico Fermi Atomic Power Plant, Unit 2 at such time as the Director determines that all requirements of the Commission attendant to the grant of an operating license are met.

6/ See, "Applicants' Proposed Findings of Fact and Conclusions of Law In The Form of a Proposed Initial Decision", dated May 3, 1982, and "NRC Staff Proposed Findings of Fact and Conclusions of Law" dated May 24, 1982. CEE did not file proposed findings.

II. FINDINGS OF FACT

1. Contention 4, as stipulated by the parties and approved by the Board, reads as follows:[7/] The following contentions and their factual bases are supported by the direct and indirect knowledge of at least one member of CEE, who is and has been personally involved in the construction of Fermi 2 since work was begun.

> (a) There has been an appalling lack of physical security at the construction site since the inception of construction. Given the need for extremely close quality control in the erection of a nuclear plant, this failing could well lead to flaws in the structure, through deliberate sabotage or unintentional unjury to components.
>
> (b) The Applicant's Quality Assurance Inspection Program has not been executed in conformance with Criterion X of

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7/ Applicants' testimony on Contention 4(a) was presented by Stuart H. Leach, Senior Administrator for Security for DECO, ff. Tr. 256 (Leach). Mr. Leach was accompanied to the witness stand by Donald Bluhm, Director of the Security Department for DECO. Applicants' testimony on Contentions 4(b), (c) and (e) was presented by Tullio A. Alessi, Director, Project Quality Assurance for the Fermi 2 Project for DECO ff. Tr. 260 (Alessi). Mr. Alessi was accompanied to the witness stand by Walter M. Street, Supervising Engineer-Civil for the Fermi 2 Project for DECO. Applicants' testimony on contention 4(d) was presented by William J. Fahrner, Manager for the Fermi 2 Project for Edison, ff. Tr. 334. (Fahrner). Mr. Fahrner was accompanied to the witness stand by Wayne H. Jens, Vice President-Nuclear Operations for DECO.

The Staff's testimony on Contention 4 was presented by Paul A. Barrett, a reactor inspector with the Engineering Inspection Branch of Region III of the Commission's Office of Enforcement and Inspection ("I&E"); Bruce Little, the Senior Resident Inspector for Fermi 2, from I&E Region III; Harvey M. Wescott, a project inspector from I&E Region III; Harry Shannon Phillips, Chief Equipment Qualifications Section of I&E Region IV; and F. C. Hawkins, a reactor inspector from I&E Region III; ff. Tr. 270. (Barrett, et al.).

Testimony on behalf of CEE on Contention 4 was presented by Frank Kuron, an ironworker who formerly worked on the construction of Fermi 2, ff. Tr. 367 (Kuron).

Appendix B to 10 C.F.R. Part 50. Recent reinspections of various materials and workmanship indicate that quality control was inadequate during construction prior to the 1974 shutdown of construction activities at the site. Specifically, CEE identifies:

(1) large and small bore pipe hangers, and

(2) welds of safety related components.

(c) The Applicant has not maintained sufficient quality assurance records to furnish evidence of activities affecting quality to comply with Criterion XVII of Appendix B to 10 C.F.R. Part 50 in that records have been destroyed or lost during the course of construction.

(d) Detroit Edison twice replaced the team of supervisors from the first general contractor, Ralph M. Parsons Co., then terminated its contract with Parsons and hired a second firm, because Parsons' employees refused to sacrifice quality control in order to expedite the construction schedule.

(e) Specific flaws in construction can be identified, among them:

(1) Excessive water in the reactor hole which caused the concrete case to crack severely, a problem purportedly remedied by patchings.

(2) Hairline cracks in structural steel surrounding the dry well.

2. The concerns raised by intervenor CEE and its witness, Frank Kuron, regarding contention 4 were raised by Mr. Kuron with IE inspectors in 1979 during meetings which occurred over parts of 4 days. This meeting included a walking tour of Fermi 2, unescorted by Applicants. Mr. Kuron was given access to every area of the plant that he desired, in order to point out his concerns to IE, and he had the opportunity to fully relate his concerns and allegations to IE. Tr. 369 (Kuron); Kuron Testimony at 5; Tr. 987-89 (Phillips); Barrett, et al., at 17, 18.

3. At the conclusion of the meetings, Mr. Kuron agreed that the IE inspectors had listed all of his concerns about Fermi 2. Tr. 388, 389

(Phillips); Tr. 368, 369 (Kuron). Neither Mr. Kuron nor CEE raised any additional concerns in their testimony at the Fermi 2 OL hearing which were not brought up during the 1979 meetings nor which were not included in the IE inspectors' list of Mr. Kuron s concerns. Tr. 369-70 (Kuron); Tr. 388-89 (Phillips).

4. IE investigated all of the concerns raised by Mr. Kuron in 1979. The areas investigated, a description of the investigation, and the conclusions reached by IE are documented in IE Report No. 50-341/79-04, which was included as Appendix A to the Staff's written testimony on this issue. Barrett, et al., at App. A.

5. IE investigators found one item of noncompliance as a result of the investigation of Mr. Kuron's allegations. All other allegations and areas of concern of Mr. Kuron were found to be either unfounded, previously identified, or addressing non-safety related areas. The one identified item of noncompliance involved voids in grouting of the sacrificial shield. Barrett, et al., at 18 and App. A, p. 5. This contruction defect was subsequently corrected by Applicants and in subsequent inspections IE inspectors found them to have been adequately resolved. Tr. 333 (Street); Barrett, et al., at 19.

6. Fermi 2 is not yet licensed to possess or use formula quantities of strategic special nuclear material within the meaning of Part 73 of the Commission's regulations. Accordingly, Applicants are not required to have in place physical security protection that is required under Part 73 for operating plants with fuel on site. Barrett, et al., at 14.

7. Nevertheless, reasonable security measures to prevent intrusion by vandals and damage to equipment have been in place at the plant site during construction. Leach at 2-7. There was no evidence of deliberate sabotage or unintentional injury to components and there is reasonable assurance that the preoperational test procedures will detect any damage to safety systems or components. Id., Barrett, et al., at 14, 15.

8. Construction deficiencies related to Mr. Kuron's allegation concerning the installation of pipe hangers had been identified by IE previously, and were corrected prior to the IE investigation. Barrett, et al., at 19; Kuron at 4. All other deficiencies regarding QA/QC at Fermi 2 alleged by Mr. Kuron were found not to be substantiated as safety-related issues, with one exception. Barrett, et al., at 19. The one exception was a void in the sacrificial shield grouting which was later corrected. Tr. 333 (Street); Barrett, et al., at 19.

9. The Applicants have had an acceptable QA/QC program in effect since the beginning of construction of Fermi 2, in accordance with 10 C.F.R. Part 50, App. A and B and Part 71, App. E.

10. There is no evidence that there was deliberate destruction of required QA records for Fermi 2. At one point, Applicants burned some unnecessary papers including personal files, working drawings and specifications, and charts. In addition, there was an accidental office fire in which a few welding records were lost. However, these records were either adequately reconstructed from other records or by personnel who had made the records, or were replaced by reexamination of welds. Barrett, et al., at 21-22; Alessi at 7.

11. There was no reliable evidence that Parsons Co. was replaced as general contractor for Fermi 2 because of the Company's refusal to sacrifice QC. Certain Parsons Co. management personnel were replaced at the Fermi 2 construction site for reasons unrelated to QC. Fahrner at 3. However, a general inquiry by IE uncovered no information which would support the allegation that Parsons Co. employees were requested by Applicants to sacrifice QC in order to expedite the construction schedule for Fermi 2. Barrett, et al., at 24. To the contrary, information obtained from approximately 50 inspections of construction activities at Fermi 2, including review by QA specialists and engineers of Fermi 2 QC procedures and their implementation, indicates that each contractor at Fermi 2 performing safety related work had a satisfactory QC program, or, if not, was cited for noncompliance and corrective action was required. QC had always been in effect at Fermi 2 since the beginning of the project. Barrett, et al., at 25.

12. Radial and circumferential hairline cracks were discovered on the surface of the Fermi 2 reactor building's 4 feet thick concrete base slab and small amounts of ground water were seeping into the reactor building floor. The cracks were repaired in 1973 with non-shrinking grout applied under high pressure and a final report to NRC was submitted in 1974. The slab was monitored by Applicants until it was clear that no new cracks had appeared. Cracking in the dry well structural steel referenced by CEE also occurred, but was limited to fine cracks in clip angles in the steel support framing for the slab over the torus. This was discovered and reported by IE in 1972. The Applicants replaced the installed clip angles where possible with those of different material and used a

different welding method. Where the angles were not accessible, Applicant installed beam seats at each angle location to assure that the load would be carried in the event of clip angle failure. Alessi at 9-11.

13. IE investigated the cracking in the reactor building base slab in 1979, and concluded that the cracking had been remedied by the grouting and that no further cracking had occurred. The cracking was under surveillance for over 6 years and was found to be satisfactorily resolved. The cracks do not impair the structural strength of the base slab. Cracking of clip angles was also repaired adequately. Barrett, et al., 26-30; Tr. 394-95 (Hawkins).

14. Contention 8 reads as follows:[8/]

> CEE is concerned over whether there is a feasible escape route for the residents of the Stony Pointe area which is adjacent to the Fermi 2 site. The only road leading to and from the area, Pointe Aux Peaux, lies very close to the reactor site. In case of an accident the residents would have to travel toward the accident before they could move away from it.

8/ Applicants presented testimony of Evelyn F. Madsen, Environmental Licensing Engineer for Detroit Edison Co.; Herbert Eugene Hungerford, PhD., Professor of Nuclear Engineering at Purdue University, Andrew C. Kanen, Traffic Management Specialist: PRC Voohees; and Roger A. Nelson, Certified Consulting Meteorologist, P.L.T. Engineering. The Staff witnesses were Falk Kantor, Division of Emergency Preparedness, Office of Inspection and Enforcement; Thomas Urbanik II Texas Transportation Institute, Texas A&M University and Rick J. Anthony, Emergency Management Specialist, Federal Emergency Management Agency (FEMA). The Intervenor's witness was Frank Kuron, an ironworker and resident of Stony Pointe, Michigan. Exhibits admitted into evidence were Staff's Safety Evaluation Report and Supplements and the Final Environmental Statement with Addendum.

15. The residential community of Stony Pointe is situated approximately one mile south of the Enrico Fermi Atomic Power Plant. There are about 1400 residents in this area. The total number of automobiles in the community is 738 (Madsen, Tr. ff. 406, p. 2; Urbanik, Tr. 567).

16. All traffic from Stony Pointe is channelled into Pointe Aux Peaux road which has a capacity of 1200 vehicles per hour at speeds of 15 to 20 miles per hour. (Kanen, Tr. ff. 406, pp. 4, 5; Anthony, Tr. ff. 533, p. 3).

17. Pointe Aux Peaux road is a two lane surfaced road which originates near Lake Erie at its eastern end and intersects North Dixie Highway at its western end (Anthony, Id., p. 3; Figures 1, 4-6 Tr. ff. 406).

18. This road is about one mile south of the plant site at the portion near Lake Erie and its route lies in a west-northwesterly direction from the Lake and bends toward the plant midway between the Stony Pointe area and the highway. Its closest point to the plant is 0.9 miles. Its length is 2.5 miles. It borders the plant site for about a mile. (Kantor Tr. ff. 533, p. 2; Kuron, Tr. ff. 367, p. 9).

19. The driving time for a single automobile from the Stony Pointe residential area to North Dixie Highway is 12-19 minutes, depending on the day of the week and weather conditions. (Kanen, Id., Table 2; Urbanik, Tr. 563; Anthony, Tr. 557).

20. The entire population of Stony Pointe could be evacuated by means of Pointe Aux Peaux road within 1-1/2 to 2-1/2 hours depending on

weather conditions, the day of the week and the amount of traffic from the plant. (Urbanik, Tr. ff. 533, pp. 2-4; Kanen, Id., p. 6, Table 2).

21. Only minimal traffic control by police would be necessary to expedite evacuation of Stony Pointe residents. (Kanen, Tr. 422, Urbanik, Tr. ff. 533, p. 3, Tr. 566, 568).

22. About 500 persons will be employed during plant operation. Plant personnel would likely be evacuated in advance of Stony Pointe residents due to earlier notification. (Madsen, Kanen, Tr. 441).

23. Utility personnel are responsible for classifying the state of emergency at the plant and giving prompt notice to State and local authorities whose responsibility it is to notify and direct the public to evacuate (Madsen, Tr. 443).

24. Detroit Edison will direct its nonessential personnel to evacuate the plant site as soon as an emergency is declared whereas the notice to the public will require the time necessary for State and local officials to make the decision and to notify nearby residents to evacuate. (Madsen, Tr. 444-445).

25. The Point Aux Peaux road compares favorably with evacuation routes and time estimates around other nuclear plant sites. (Kantor, Tr. ff. 533, p. 4, Tr. 549) and has no unusual or unmanageable traffic problems. (Urbanik, Id. p. 4).

26. The short distance (¼ mile or less) that the Pointe Aux Peaux road extends toward the plant site is not a significant or limiting factor for emergency planning purposes. (Kantor, Tr. ff. 533, p. 5, Tr. 559; Urbanik, Tr. 564-5).

27. Stony Pointe residents will not be ready to leave simultaneously if evacuation is ordered because of varying personal circumstances, so that Stony Pointe traffic will be dispersed over time. (Kanen, Tr. 438-441, Tr. ff. 406, pp. 7-8, Urbanik, Tr. 566).

28. Emergency plans for nuclear plants incorporate protective action guidelines developed by the Environmental Protection Agency. The guidelines are based on a wide spectrum of possible accidents. In the event of an accident at a nuclear plant, the probable resulting radiological emissions from the particular accident will determine the appropriate protective action for the public. Protective actions available include sheltering (inside homes, offices) and evacuation before, during, or after radioactive releases. Protective actions are intended to minimize radiation exposures. (Kantor, ff. 533, p. 2-5; Tr. 540-544, Tr. ff. 406, Table 5, Madsen, Tr. 453-457).

29. In the event of an accident causing a radioactive plume which moved over the Stony Pointe area, the residents could be protected by precautionary evacuation, if time allowed, or sheltering while the plume passed over the area and then relocation, or by sheltering alone. The time necessary to evacuate Stony Pointe will be available to decision makers in determining appropriate measures to take. (Kantor, Tr. ff. 533, pp. 3-4).

30. Dose calculations are significant in deciding the appropriate protective action, not for evaluation of evacuation routes. (Kantor, Tr. 540-548.)

31. The increase in dose to individuals traveling approximately 1/4 mile closer to a nuclear plant is insignificant, (less than 10%) regardless of the emissions. (Kantor, Tr. 559, 567, 568, 570).

CONCLUSIONS OF LAW

The Board has considered all the evidence submitted by the parties and the entire record of this proceeding. Based on the Findings of Fact set forth herein, which are supported by reliable, probative and substantial evidence in the record, this Board, having decided all matters in controversy, concludes that, pursuant to 10 C.F.R. § 2.760a and 10 C.F.R. § 50.57, the Director of Nuclear Reactor Regulation should be authorized to issue to the Applicants, upon making requisite findings with respect to matters not embraced in this Initial Decision, a license that authorizes operation of the Enrico Fermi Atomic Power Plant, Unit 2.

ORDER

Wherefore, it is ordered that the Director of Nuclear Reactor Regulation is authorized, upon making requisite findings with respect to matters not embraced in this Initial Decision, in accordance with the Commission's regulations, to issue to Applicants, an operating license for a term of not more than forty (40) years, authorizing operation of the Enrico Fermi Atomic Power Plant, Unit 2 at steady-state power levels not to exceed 3292 megawatts thermal. Such license may be in such form and content as is appropriate in light of such findings, provided that such a license is consistent with the conclusions of the Licensing Board herein.

It is further ordered that this Initial Decision shall constitute the final action of the Commission forty-five (45) days after the issuance thereof, subject to any review pursuant to 10 C.F.R. §§ 2.760, 2.762, 2.764, 2.785, and 2.786.

Exceptions to this Initial Decision may be filed within ten (10) days after its service. A brief in support of the exceptions shall be filed within thirty (30) days thereafter and forty (40) days in the case of the Staff. Within thirty (30) days of the filing and service of the brief of the Appellant, and forty (40) days in the case of the Staff, any other party may file a brief in support of, or in opposition to, the exceptions.

IT IS SO ORDERED.

FOR THE ATOMIC SAFETY AND LICENSING BOARD

Gary L. Milhollin
Administrative Judge

Peter A. Morris
Administrative Judge

David R. Schink
Administrative Judge

Dated at Bethesda, Maryland
this 24th day of May, 1982