Detroit Edison
2000 Second Avenue
Detroit, Michigan 48226
(313) 237-8000

December 7, 1982
EF2 - 61,063

Mr. Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Eisenhut:

References: (1) Enrico Fermi Atomic Power Plant, Unit 2
NRC Docket No. 50-341
(2) Letter D. Eisenhut to H. Tauber,
October 29, 1982, "Independent Design
Verification Program for Fermi 2"

Subject: Scope of an Independent Design
Verification Program for Fermi 2

Your Reference 2 letter requested that Detroit Edison provide a proposal for an Independent Design Verification (IDV) Program for Fermi. You suggested that the systems involved in the shutdown and cooldown of the plant for a seismically induced loss of offsite power be considered in the scope of such an IDV.

Although we believe that our presentation to Mr. Denton on July 15, 1982 on this subject demonstrated extensive design verification for Fermi 2, we presented a proposed scope for an IDV on December 1 which was responsive to your request. Mr. Robert Purple, acting in your behalf, found our proposed scope acceptable. In addition, we identified a contractor, Cygna Energy Services, whom we have selected to peform the IDV. Mr. Purple found the proposed contractor acceptable based on the assumption that a positive finding could be made on the competence and independence of the personnel scheduled to do the work for Cygna on Fermi 2. This finding must be made subsequent to the submittal of the Program Plan by Cygna to perform the IDV for Fermi 2. As agreed at the meeting, Detroit Edison will submit Cygna's Program Plan

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on or before December 15. As per the request of your Staff, to expedite your review and approval of the Program Plan by December 22, we have scheduled a meeting with your Staff for the afternoon of December 20 to provide clarification and to answer questions on the Plan.

There was much positive dialogue and clarification provided on our proposed scope and good general discussion on the role and purposes of IDVs in general. The approval of the scope provides Detroit Edison with the confidence to allow Cygna to proceed with their review. We also feel very strongly that it is responsive to the identified areas of interest, both from your Staff and Region III and that the completed IDV on the identified scope will be useful to both you and ourselves in providing additional assurance that Detroit Edison's handling of the design, design control, and contractor interfaces has been adequate.

Attachment 1 to this letter is a copy of our scope as discussed and approved by your Staff. The form and content of the attachment is essentially identical to the handouts provided at the December 1 meeting except where clarification was required.

We appreciate in advance your efforts to expedite the review of Cygna's Program Plan. Your approval of the Plan by December 22 is required in order for us to remain on schedule and meet the milestone date of April 13, 1983 for Cygna's submittal of the Final Report.

Should you have any additional questions, please contact Mr. L. E. Schuerman, (313) 649-7562.

Sincerely,

Harry Tauber

Harry Tauber
Group Vice President

Attachment

cc: Mr. B. Davis (Region III)
Mr. L. L. Kintner
Mr. B. Little
Mr. M. D. Lynch

SCOPE OF AN INDEPENDENT DESIGN VERIFICATION (IDV) FOR FERMI 2

I. Introduction

The scope of an IDV for Fermi 2 was chosen to be responsive to the areas of interest identified in the October 29, 1982 NRC to Detroit Edison letter and other NRC correspondence and Detroit Edison/NRC meetings. These primary areas of interest are as follows:

A. Interfaces (in parallel and in series)

The scope should involve a number of interfaces between various contractors both operating in parallel in time and sequentially over a long time span.

B. Cross Section of Disciplines and Plant Features

The scope should provide for a review of a cross-section of disciplines (mechanical, electrical, etc.) and plant features (various systems).

C. Important to Safety (Safe-Shutdown Path)

The scope should involve systems or elements important to safety (preferably taken from the path to safe shutdown).

D. Design Changes

The scope should be large enough and complex enough such that it involves the normal in-process design changes that are seen routinely in the construction of nuclear facilities.

E. Involves S&L

The scope should include elements which involved Sargent and Lundy in the design process.

In developing a meaningful scope, it is also prudent to choose review elements which are not verified by testing, since testing is one way of design verification. Another consideration is, of course, the financial and schedular restraints to complete the Fermi 2 project. With these aspects in mind, three areas of review were chosen which, as an entity, are responsive to all the areas of interest identified.

The review areas chosen are derived from the three elements of the fluid path to remove decay heat: (1) the RHR shutdown cooling mode, (2) the RHR service water system, and (3) the RHR complex cooling tower. This fluid path is shown conceptually in Figure B-1. The explicit boundary of each element and the aspects within that boundary to be reviewed

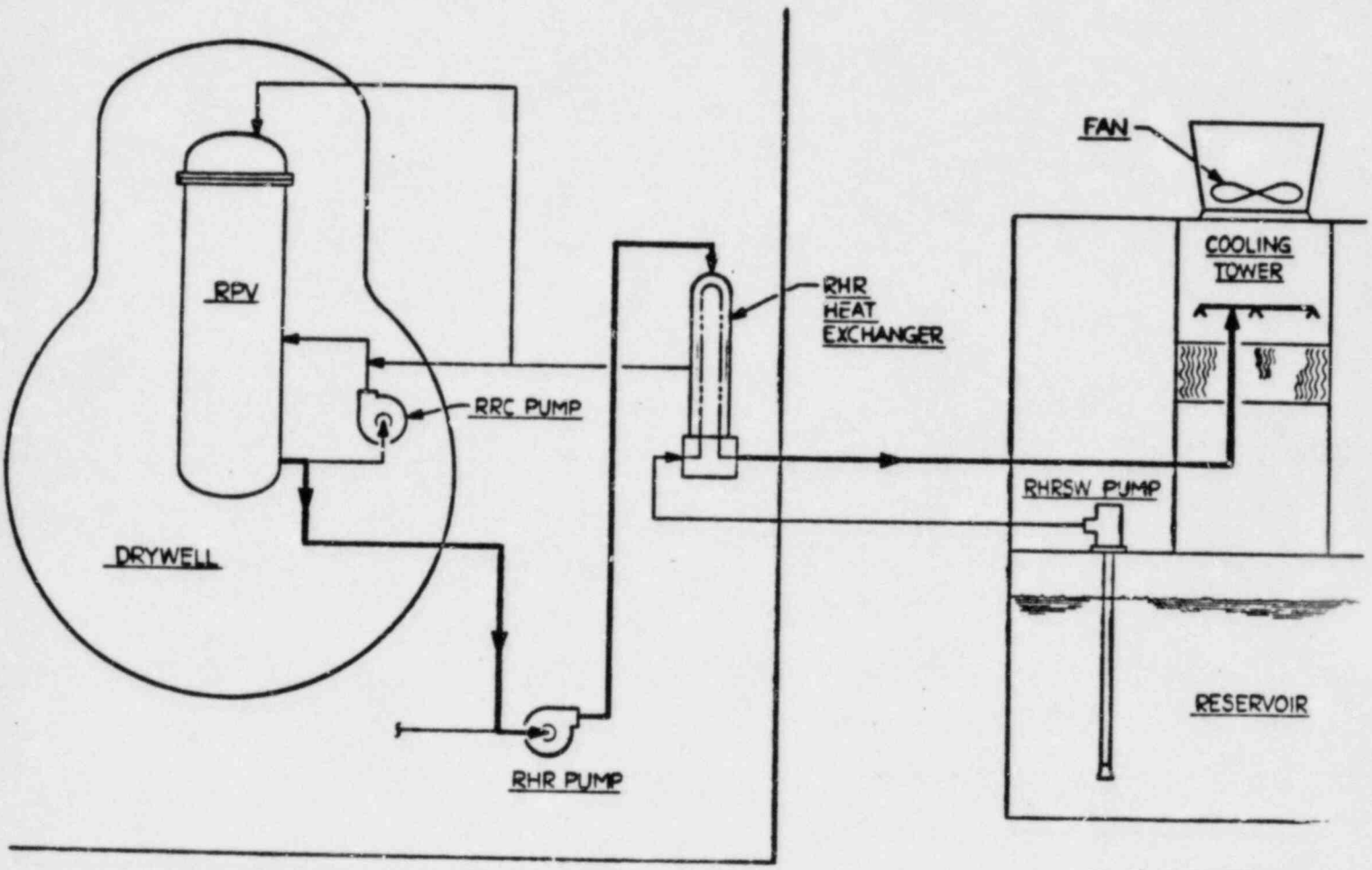
FAN
COOLING TOWER
RPV
RHR HEAT EXCHANGER
RRC PUMP
RHRSW PUMP
DRYWELL
RESERVOIR
RHR PUMP
REACTOR BLDG
RHR COMPLEX

FIG. B-1

are discussed under items II through IV below. How the scope of each review element is responsive to the areas of interest is also discussed. Item V discusses, in addition, the broad objectives to be pursued by the contractor in performing the IDV to insure the requisite level of assurance is provided by his review.

II. RHR Shutdown Cooling Mode Element

A. Boundary

Primary RHR shutdown fluid path from the recirculation system interface (suction line) to and including the outboard containment isolation valve.

B. Review Aspects Within Boundary

1. Review that the classification and specification of the piping and valves in the main fluid path are adequate with respect to the design basis (e.g. safety class, ASME Code Class, Pressure/Temperature conditions, Load and LOCA combinations*, material requirements). The design basis is derived from appropriate system specification and performance documents and the FSAR.

2. Review that the mechanical design has been adequately implemented in accordance with the applicable ASME code and design basis as defined in (1) above for the piping, pipe supports, containment penetration and valves. Adequately implemented in this context implies the entire scope of the

* External dynamic load inputs (e.g. seismic, pipe break, hydrodynamic, etc.) will be given by Detroit Edison.

mechanical design process after specification, from initial system layout and P&ID generation to the final as-built stress analysis and configuration check, is available for the independent reviewer to audit as required within the defined system boundary.

C. Response to Areas of Interest

1. Importance to Safety

Area to be reviewed involves the preferred fluid path for removal of decay heat. In addition, it involves a portion of piping which is inside containment and therefore is normally inaccessible. [redacted] involves a containment boundary and [redacted] pressure/ low pressure boundary.

2. Cross-Section of Disciplines and Plant Features

Area to be reviewed involves the mechanical discipline. However, this discipline has been the historical concern area for IDVs. It involves a number of plant features including Class I piping, containment isolation valves, a containment penetration, and pipe hangers and snubbers.

3. Interfaces

The area to be reviewed involves numerous contractor interfaces, including Detroit Edison, CB&I, Tube Turns, GE, Stone and Webster, Wismer-Becker, and Concourse Engineering.

4. Design Changes

The area to be reviewed has had in-process design changes including one major design change -- the addition of a parallel shut-down cooling valve inside containment.

5. Sargent and Lundy (S&L) Involvement

S&L was not involved in this area.

III. RHR Service Water Element

A. Boundary

RHR service water (RHRSW) main fluid path from the RHRSW return at the RHR complex building interface to a RHR cooling tower.

B. Review Aspects Within Boundary

1. Review that the mechancial design has been adequately implemented in accordance with the applicable specification and design basis emphasizing the A/E internal design interfaces and the interfaces among the A/E, the constructor(s), and the Detroit

Edison Company. The design basis is derived from the appropriate system specifications and performance documents and the FSAR. Adequately implemented in this context implies the entire scope of the mechanical design process after specification, from initial system layout and P&ID generation to the final as-built stress analysis and configuration check, is available for the independent reviewer to audit as required within the defined system boundary. Emphasizing interfaces in this context implies that the emphasis of the independent reviewer should be on the correct transmission of information across interfaces, e.g. mechanical design information was correctly transmitted from the mechanical group to the structural group within the A/E and evidence exists that it was utilized correctly --or-- mechanical information was correctly transmited to the contractor and implemented in the field with appropriate iteration as required.

C. Response to Areas of Interest

1. Importance to Safety - area to be reviewed involves the safety grade fluid path for removal of decay heat.

2. Cross-Section of Discipline and Plant Features - area to be reviewed involves the mechanical area, but emphasizes interfaces internal to the A/E and with the Detroit Edison Company and the Constructor(s).

3. Interfaces - area to be reviewed involves a Detroit Edison concept which was contracted to S&L for A/E services. This involves a more traditional A/E/utility/constructor interface for review. The constructor was Wismer-Becker.

4. Design Changes - the area involved is sufficiently complex to have had in-process design changes.

5. Sargent and Lundy (S&L) Involvement - S&L provided the entire A/E services for this review area.

IV. RHR Complex Cooling Tower Element

A. Boundary

An RHR Complex Cooling Tower

B. Review Aspects Within the Boundary

1. Review that the electrical design requirements for the power supply design of one cooling tower fan motor from the diesel generator bus to the motor were adequately implemented (e.g. source of power, voltage requirements, cable requirements - insulation and rating, fault interruption design). Emphasize in the review the interfaces among the A/E, The Detroit Edison Company, and the equipment supplier. The electrical design requirements are obtained from the appropriate component specification and performance documents and the FSAR. Adequately implemented in this context implies the entire scope of the electrical design process after specification, from the layout of the electrical one-line diagram to the design details for breakers and cables, to a configuration check in the field, is available for the independent reviewer to audit as required within the defined system boundary. Emphasizing interfaces in this context implies that the emphasis of the independent reviewer should

be on the correct transmission of information across interfaces, e.g. the correct fan motor data was adequately transmitted and utilized by the A/E in his design.

2. Review that the RHR cooling tower support is adequately supported to withstand Design Basis Earthquake (DBE) conditions*. This review area involves review of the structural design of the RHR complex insofar as it is necessary to support the RHR cooling tower. The structural design in this area should be further evaluated against the given DBE accelerations for functionality in conformance with FSAR requirements.

C. Response to Areas of Interest

1. Importance to Safety

Area to be reviewed involves the final element in the safety grade decay heat removal path.

2. Cross Section of Disiplines and Plant Fatures

The area to be reviewed involves the electrical and structural disciplines of an important component. It is also diverse from other areas to be reviewed.

*Seismic input accelerations will be provided by Detroit Edison.

3. Interfaces

The area to be reviewed involves a Detroit Edison concept, a cooling tower designed by Marley, and a detailed design implemented by Comstock and Utley-James.

4. Design Changes

The area involved is an area which characteristically should not have significant in-process design changes.

5. Sargent & Lundy (S&L) Involvement

S&L provided the entire A/E service for this review area.

V. CONTRACTOR'S OBJECTIVES

Besides performing the detailed review of the defined scope as discussed above, the contractor for the IDV on Fermi 2 is tasked with a broad objective:

"Provide independent assurance that the design of the shutdown cooling path is adequate, given the level and scope of the review. In addition, the review should provide positive assurance that Detroit Edison's design, design control, and interface practices with outside contractors has been adequate."

The purpose of this statement is for the contractor to gauge the depth of his review in order to come to a broad-based conclusion on the overall adequacy of the design of Fermi 2 as implemented in the field. This will, of course, involve checks against the design basis (specifications, FSAR, etc.) the design development process including interfaces and design changes, and configuration checks in the field as required.