TMI-1

February 10, 1983

SECY-83-61

# ADJUDICATORY ISSUE
(Affirmation)

For: The Commission

From: Trip Rothschild
Acting Assistant General Counsel

Subject: UCS OBJECTION TO COMMISSION MEETING REGARDING TMI-1 SEISMIC CONCERNS AS VIOLATING EX PARTE PROHIBITION

Purpose: To recommend that

Discussion:

Background

On December 17, 1982 the staff briefed the Commission concerning seismic qualification of the emergency feedwater system (EFWS) at the Three Mile Island, Unit 1 (TMI-1) nuclear facility. This meeting was called in response to a board notification indicating that the Lawrence Livermore National Laboratory (LLNL), a staff consultant, had concluded that the EFWS at TMI-1 is not likely to withstand a safe shutdown earthquake (SSE). The Commission provided the parties to the TMI-1 Restart proceeding an opportunity to comment on this meeting. On January 7, 1983 UCS submitted its comments. UCS simultaneously objected to the meeting as

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violating the prohibition against ex parte communications.

UCS in its motion stated that the "principal subject discussed at the December 17 Commission meeting involved the reliability of the TMI-1 emergency feedwater (EFW) system at restart." UCS then asserted that it had maintained throughout the proceeding that the Director's recommended short-term actions are not sufficient to protect the public health and safety, and that whether the EFWS should be required to be fully safety grade before restart was a contested issue. UCS claimed that it violated the ex parte prohibition to allow the staff (who stated that this new information did not affect its testimony in the Restart proceeding) and licensee (who claimed that the information was technically incorrect) to address the Commission on this subject while not allowing UCS an opportunity to rebut these statements. UCS, noting that misinformation cannot be effectively rebutted by a later opportunity to submit comments, moved the Commission to conduct this proceeding in accord with its own regulations.1/

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1/ UCS also asserted that the Commission has never ruled on its previous objections to ex parte communications. The Commission denied UCS' earlier motions in an unpublished Order dated March 10, 1982.

UCS in this connection asserted in its motion that SECY-83-384A, "Three Mile Island, Unit 1 (TMI-1), NUREG-0737 Items Status" (December 6, 1982), is the latest example of this continuing pattern of ex parte communications.

Neither the staff nor the licensee responded to the UCS motion.

Trip Rothschild
Acting Assistant General Counsel

Attachments:
(1) UCS Motion
(2) Proposed Order

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2/ The Appeal Board in ALAB-708 noted that seismic qualification of the EFWS was outside the scope of the Restart proceeding and that the matter would be considered by the staff and Commission outside the adjudicatory process. ALAB-708 at 7 n.5.

Commissioners' comments or consent should be provided directly to the Office of the Secretary by c.o.b. Tuesday, March 1, 1983.

Commission Staff Office comments, if any, should be submitted to the Commissioners NLT Tuesday, February 22, 1983, with an information copy to the Office of the Secretary. If the paper is of such a nature that it requires additional time for analytical review and comment, the Commissioners and the Secretariat should be apprised of when comments may be expected.

This paper is tentatively scheduled for affirmation at an Open Meeting during the Week of March 7, 1983. Please refer to the appropriate Weekly Commission Schedule, when published, for a specific date and time.

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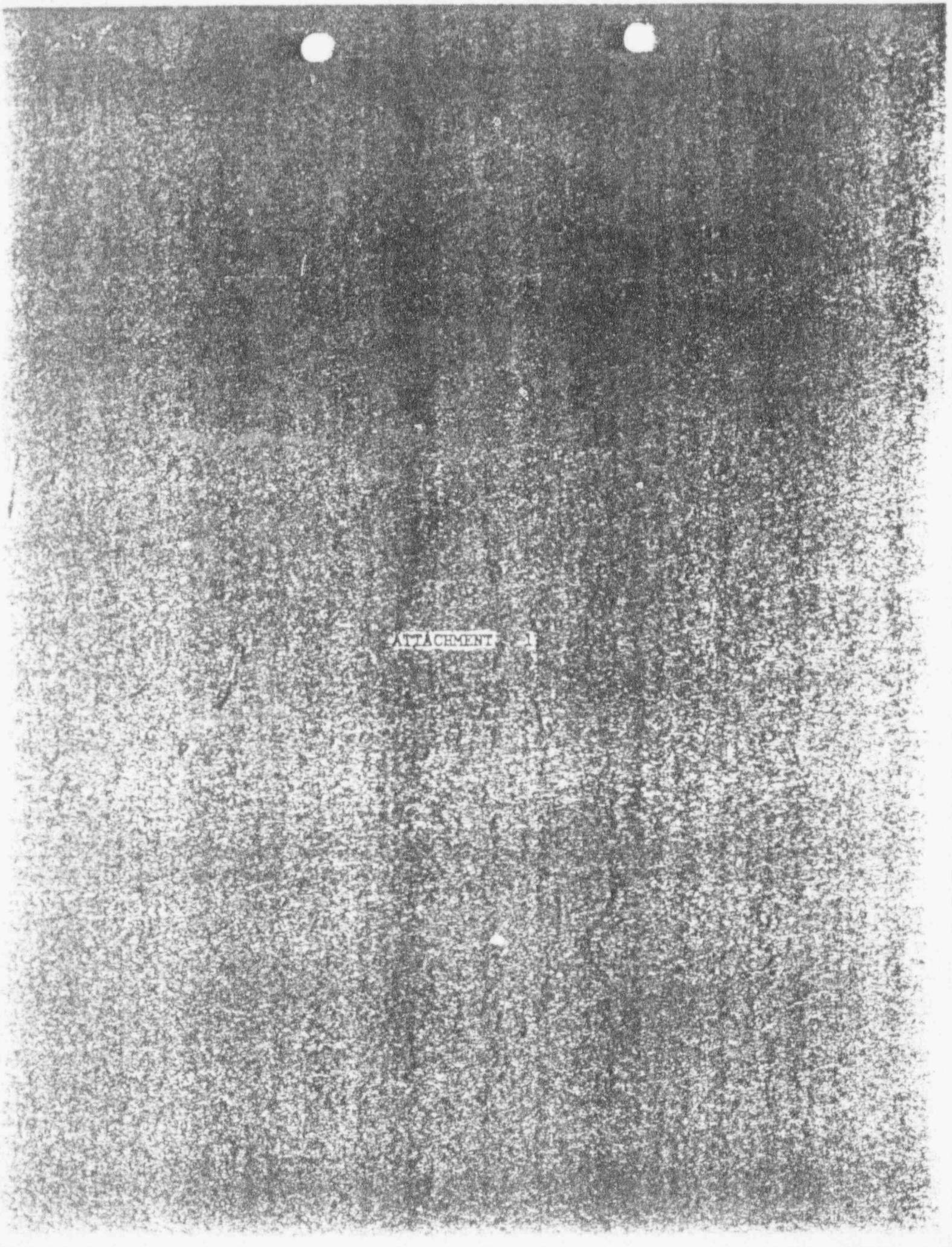
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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

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| In the Matter of | ) | |
| | ) | |
| METROPOLITAN EDISON COMPANY | ) | Docket No. 50-289 (Restart) |
| | ) | |
| (Three Mile Island Nuclear Station, Unit No. 1) | ) | |

UNION OF CONCERNED SCIENTISTS' COMMENTS ON THE COMMISSION'S EX PARTE MEETING OF DECEMBER 17, 1982 AND STATEMENT OF CONTINUING OBJECTION TO EX PARTE COMMUNICATION

INTRODUCTION

By a "Memorandum for Counsel for TMI-1 Parties," dated December 20, 1982, the Secretary of the Commission transmitted a copy of the transcript of the December 17, 1982 Commission meeting regarding TMI-1 (hereinafter, "Comm. Tr.") and one three-page document, "TMI-1 1982 Board Notifications," discussed at the Commission meeting.[1/] On December 29, 1982, the Commission extended the time for all parties to comment on the matters discussed at this meeting to January 7, 1983. The Union of Concerned Scientists (UCS) hereby: 1) submits its comments on the matters discussed; 2) objects to the December 17, 1982 Commission

1/ The Secretary's Memorandum states that a copy of the transcript "and the accompanying handouts" are enclosed. (emphasis added) Only one such "handout" was attached to UCS's copy of the transcript.

meeting on the grounds that it was a prohibited ex parte communication between the Commission and two parties (the Staff and the Licensee) involving an issue (reliability of TMI-1 emergency feedwater system) contested by UCS in this proceeding; and 3) moves that the Commission direct that, henceforth, this proceeding shall be conducted in accordance with the procedural rules set forth in 10 CFR Part 2, Subpart G.

OBJECTION TO EX PARTE COMMUNICATIONS

UCS has previously objected to the pattern of ex parte communications in this proceeeding. See: "UCS Objection to Staff Briefing of the Commission and Motion for Relief," December 18, 1981; "UCS Comments on Staff Briefing of Commission and Renewal of Motion for Affidavits Concerning Ex Parte Contacts," January 13, 1982; "Motion for Cancellation of Commission Meeting on TMI-1 Restart Contested Issues," January 21, 1982; and "Union of Concerned Scientists Objection to Ex Parte Communications," November 4, 1982. We do not repeat here all the arguments and motions previously filed. The Commission has never formally ruled on UCS's previous objections to ex parte communications between the Staff and the Commission, Licensing Board, and Appeal Board in this proceeding. Nor has the Commission ever ruled on the several motions made by UCS regarding future conduct of this proceeding and actions necessary to correct, if possible, the prejudice to UCS caused by past ex parte communications.

The Commission meeting on December 17, 1982 regarding TMI-1 restart was, in UCS's view, a prohibited ex parte communication

with the Staff and the Licensee. The principal subject discussed at the Commission meeting involved the reliability of the TMI-1 emergency feedwater (EFW) system at restart. It is beyond question that an issue contested by UCS was whether the TMI-1 EFW system should be required to be fully safety grade before restart. UCS's position regarding the TMI-1 EFW system has been, and remains, that the short-term actions recommended by the Director of Nuclear Reactor Regulation are not sufficient to provide reasonable assurance that TMI-1 can be operated without endangering the health and safety of the public. The Licensing Board ruled that the TMI-1 EFW system is not adequately reliable, either in its present non-safety grade configuration proposed for restart or even after it is upgraded to fully safety grade.

The Staff has now belatedly informed the Appeal Board that the Staff's consultant has concluded that the TMI-1 EFW system cannot even withstand an Operating Basic Earthquake (OBE), much less a Safe Shutdown Earthquake (SSE). The Commission has held an ex parte meeting with the Staff and the Licensee during which those parties alleged, respectively, that this new information does not affect their testimony in this proceeding and that the Staff's consultant is technically incorrect. There was no opportunity to challenge these statements, both of which were incorrect. UCS was not allowed to participate in the meeting called to discuss a matter which has been under review by the Staff since the TMI-2 accident as a "lesson learned" and which has been the subject of written correspondence between the Staff and Licensee (most of which was not served on UCS) since February of 1981. A more egregious violation of UCS's rights to due process is difficult to imagine.

While the Commission has the right and responsibility to obtain factual information on safety problems from the Staff, this does not permit the Commission to invite two parties to this case to present clearly self-serving opinions while excluding the one party with a different point of view.

Previous ex parte meetings with the Staff were the subject of earlier objections by UCS. The enlargement of these meetings to include the Licensee, while continuing to exclude UCS, indicates to us a wholesale disregard of the prohibitions against ex parte communications and of principles of fairness. Nevertheless, UCS hereby objects to the December 17, 1982 Commission meeting with the Staff and the Licensee in this proceeding on the grounds that the meeting violated the prohibitions against ex parte communications set forth in the Administrative Procedure Act and 10 CFR Part 2.

UCS also moves again that the Commission direct that this proceeding shall henceforth be conducted in accordance with the procedural rules set forth in 10 CFR Part 2, Subpart G. We urge the Commission to act promptly on this motion. In the absence of a ruling, the Staff continues the very practices that were the subject of UCS's objections. We refer here to the Staff's latest ex parte communication of which we are aware. SECY-82-384A, "Three Mile Island, Unit 1 (TMI-1) NUREG-0737 Items Status," dated December 6, 1982, was distributed by the EDO to the Commissioners, the Licensing Board, and the Appeal Board, but not to UCS.[2/] The

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2/ UCS finally received a copy on December 27, 1982, without a certificate of service. We intend to comment on the substance of SECY-82-384A in a separate filing as soon as possible. We can only note here that it contains seriously misleading conclusions.

longer this pattern of ex parte communications continues, the more difficult and time-consuming it will be to try to remedy the prejudice to UCS.

UCS believes that its objections to the ex parte communications in this proceeding are well founded in law and cast serious doubt on the legal validity of Commission decision-making in this matter. We also believe that such conduct prevents the Commission from earning the confidence of the public it is responsible for protecting. Nor does this type of meeting serve what must be the Commission's primary goal: obtaining accurate and complete information as a basis for its actions. We will demonstrate below that the broad, unsubstantiated, assertions made by the Staff and Licensee are factually incorrect. As a practical matter, such misinformation cannot be effectively rebutted by a later opportunity to comment on transcripts of ex parte Commission meetings.

First, the broad, unsubstantiated assertions made orally by the Staff and Licensee are more easily understood than the detailed, written comments which are necessary to demonstrate the invalidity of those assertions. The Staff and Licensee gain a decided advantage when they are allowed to make sweeping statements, not under oath, which in their most favorable interpretation can be characterized as soothing reassurances, especially when there is no opportunity for probing cross-examination by UCS. The Staff and Licensee are free to do so, relying on the fact that the Commissioners themselves can have little detailed knowledge of the TMI-1 EFW system, the regulations,

regulatory guides, and Standard Review Plan sections applicable to EFW systems, and the evidentiary record in this proceeding.

Second, it is apparent that the Commissioners personally do not read the written comments and there is even some indication that the system for review of this material by Commission-level Staff is haphazard:

> COMMISSIONER AHEARNE: We read everything that comes up, all of us ---
>
> (Laughter.)
>
> Comm. Tr. at 47.
>
> MR. DENTON: OGC is monitoring all this paper and not just what is filed as a Board notification but what we are filing as affidavits and ---
>
> COMMISSIONER AHEARNE: I think audit is probably ---
>
> (Laughter.)
>
> CHAIRMAN PALLADINO: Well, I think if there is no problem on our getting these things, unless the Commission wants to deliberate it further, I would say send them to us.
>
> COMMISSIONER AHEARNE: Now in that sending it to us are you accepting Vic's recommdation [sic] that Jack review them all?
>
> CHAIRMAN PALLADINO: I didn't go that far yet.
>
> MR. CHRISTENBURY: Mr. Chairman, if I could seek clarification. Are you suggesting that for just in TMI or all Board notification copies should come to the Commission?
>
> CHAIRMAN PALLADINO: Let me reverse myself.
>
> (Laughter.)
>
> Comm. Tr. at 55, 56.

Third, we have no way of being assured that the comments are understood, considered or resolved in any way. There is no system for response by the Commission. From UCS's perspective, our

submissions sometimes seem to dissolve into a regulatory black hole.

In sum, UCS believes that the December 17, 1982 Commission meeting was a prohibited ex parte communication which prejudiced UCS and that the opportunity to comment on the subjects discussed does not ameliorate that harm. Our substantive comments follow.

## THE LACK OF SEISMIC QUALIFICATION OF THE EFW SYSTEM POSES A SUBSTANTIAL SAFETY HAZARD

The nature and extent of the safety problems which result from the lack of seismic qualification of the TMI-1 emergency feedwater (EFW) system were substantially distorted and underplayed by the Staff and Licensee on December 17. Typical of this was the following statement by GPU Nuclear Executive Vice President Phillip Clark:

> The majority of the questions raised by Livermore have to do with the steam driven turbine pump and some of its controls which are in the nonseismic turbine building. Comm. Tr. at 20.

Indeed, throughout the session, the Commission was led to believe that the major (if not the only) dispute of substance between Livermore and GPU was whether the non-seismically qualified turbine-driven EFW pump and its piping and controls are required to remove decay heat and thus, must be seismically qualified. We will discuss below the spurious nature of this belated argument, put forward by GPU only in the last few days before the Commission meeting. It should be noted in passing, however, that it was not

Livermore that c.assified the turbine-d .ven pump and its associated systems as necessary to remove decay heat but the Licensee itself. The Staff's generic letter directed Licensees to evaluate the seismic qualifications of the auxiliary feedwater system, defined as follows: "The AFW system boundary from suction to discharge...shall include those portions of the system required to accomplish the AFW system function...." Generic Letter 81-14, Enclosure 1 at 1. In response to this, GPU included the turbine-driven pump and associated systems. (As did, so far as we are aware, every other similarly situated licensee. Comm. Tr. at 34.) Only after the evaluation showed that the turbine-driven pump could not survive even an operating basis earthquake did GPU construct the "novel" rationale (Comm. Tr. at 33) that the pump is not essential for decay heat removal. Before discussing this new argument, however, we wish to draw the Commission's attention to the fact that contrary to the impression given on December 17, 1982, there are other aspects of the Livermore review, wholly unrelated to the turbine-driven pump, which are at least as serious in terms of their implications for public safety.

The following systems and components unrelated to, and in addition to, the turbine-driven pump, are not seismically qualified:

1. EFW pump recirculation lines;[3/]

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3/ Reference No. 3 cited in the Technical Evaluation Report, Three Mile Island Nuclear Station, Unit 1, Seismic Qualification of Auxiliary Feedwater System. (Hereinafter the Technical Evaluation Report and its References are cited as "TER" and "TER Ref. ___.")

2. Portions of the EFW suction piping to the condenser hotwell, for which there are no double isolation valves between the seismic Class 1 piping and the non-seismic Class 1 piping;[4/]

3. EFW pump minimum flow valves (recirculation valves) and their controlling flow switches and associated circuitry;[5/]

4. Electro-pneumatic converters for the EFW flow control valves, EF-V30A and EF-V30B;[6/]

5. Condensate storage tank low level alarms;[7/]

6. Circuitry for main steam dump isolation valves MS-V2A, MS-V2B, MS-V8A and MS-V8B;[8/]

7. Circuitry for condensate storage tank isolation valves CO-V10A, CO-V10B, CO-V14A and CO-V14B;[9/]

8. Circuitry for condensate storage tank cross connect valves CO-V11A and CO-V11B;[10/]

9. Control system for atmospheric relief valves MS-V4A and MS-V4B;[11/]

10. Vent stacks for both the main steam relief valves and the atmospheric dump valves.[12/]

11. Main steam isolation valves.[13/]

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4/ TER Ref. 3, enclosure, unnumbered page 2.
5/ TER Ref. 5, enclosure, Table A.
6/ Id. In addition, it is unclear whether the EFW flow control valves are themselves seismically qualified because Licensee provided no information on them.
7/ Id.
8/ Id.
9/ Id.
10/ Id.
11/ TER Reference 7, Enclosure 1, Table A-A and unnumbered pp. 6,8.
12/ TER Reference 9.
13/ It was disclosed at a meeting between the Staff and GPU on January 7, 1983, that none of the four main steam isolation valves can be closed after an earthquake.

While we have not calculated the percentage of non-seismic components which can be associated with the turbine-driven pump, it is quite clear from a perusal of GPU's submittals that, contrary to the assertions of Mr. Clark (Comm. Tr. at 23), 90% of the issues do not relate to the turbine-driven pump question and the dispute over what portions of the EFW system are "required" for decay heat removal.

The broad safety implications of the lack of seismic qualification are revealed by considering the following scenarios described by GPU, which demonstrate that Mr. Clark was inaccurate in asserting that the TMI-1 EFW system is "seismic plus single failure" (Comm. Tr. at 19):

> Seismic Event Coincident with Loss of Offsite Power with a Single Failure of an Active Component
>
> During this event, a postulated failure of either valve CO-V-14A or CO-V-14B to isolate the CST from the non-seismic line will drain the water inventory of both tanks through the broken lines at an approximate rate of 4,400 GPM. A low level (Technical Specification level) alarm of each tank will alert the operator to take action. The operator has sufficient time (20 minutes) to access the Intermediate Building to manually close either of the motor operated valves so that a sufficient quantity of water will be available from both CSTs for EFW system operation and sufficient to cool to the point of Decay Heat Removal initiation. However, if the valve is stuck open or the operator can not access the building to manually close the valve, water in both tanks will be drained out and cause a loss of water inventory for EFW system function. Thus, in order to mitigate or prevent this gross loss of water inventory a modification to the Condensate System and Condensate Storage Tank is required.
>
> TER Ref. 7, Enclosure 2 at 3-4, emphasis added.

Thus, Mr. Clark's statement that the TMI-1 EFW system is "seismic with a single failure" is incorrect. Failure of the valve to close is a single failure within the meaning of NRC practice.

Another accident scenario described by GPU is the following:

> Seismic Event Coincident with Loss of Offsite Power Without a Single Failure of an Active Component
>
> During a postulated seismic event coincident with a loss of offsite power, a line break in the non-seismic piping downstream of either valve CO-V-14A or valve CO-V-14B could drain the water from both tanks through the broken lines to the Turbine Building Sump or Intermediate Building depending on the location of line break. However, the motor operated valves CO-V-14A and B, which are powered from Class 1E sources, can be remotely controlled from the control room to isolate the broken non-seismic lines. This maintains a sufficient water inventory for the EFW system safety function from CSTs if the seismic event did not sever the power supply for these valves in the non-seismically designed portion of its cable routing. It assumes that both CSTs are at the Technical Specification water inventory levels and allows 20 minutes for an operator action.
>
> Id. at 3, emphasis added.

If either the non-seismically routed cables are severed (and there is no reason presented to believe that they will not be severed) or one of two valves fails (the "single failure"), the result would be insufficient inventory in the condensate storage tanks for EFW system function. Furthermore, even assuming that the leak of 4,400 GPM could eventually be isolated, neither the Licensee nor Livermore appears to have given any consideration to the potential for failure of other essential equipment located in the Intermediate Building which could be caused by flooding of that building. For example, motor-operated EFW valves EF-V4 and EF-V5 are normally locked closed and are located in the basement of the Intermediate Building. These valves must be opened in order to provide the backup source of water for the EFW pumps from the reactor building emergency cooling system. TER Ref. 3, Enclosure,

unnumbered page 2. Thus, the failure of the non-seismic Class I piping on the suction side of the EFW pumps may in turn cause failure of the very system which is alleged to be a backup to the water supply from the condensate storage tank. Furthermore, other safety-related equipment is also located in the Intermediate Building. For example, valves necessary for containment isolation or other safety functions which are located in that building include the reactor building purge line, feedwater isolation valves, containment monitoring isolation system, emergergency cooling river water, and nuclear services closed loop cooling system.[13/] The level of attention given by GPU to such crucial details was apparently minimal at best.

In its December 20, 1982, response to the TER, GPU claimed that flow through the failed recirculation line "would not present a loss of safety function, but rather "only create an inplant spill."[14/] Although it referenced TER Ref. 7, Enclosure 2, Licensee apparently neglected to note that, according to its own earlier evaluation, flow lost through the broken recirculation line from the EFW pumps must be added to the flow lost from the de-icing line connected to condensate storage tank B. As Licensee noted earlier, "the combined loss of water...would present a safety concern...." TER Ref. 7, Enclosure 2 at 4.

As noted above, none of the safety hazards previously discussed relates to the question of whether the turbine-driven

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13/ The location of this equipment is derived from the System Component Evaluation Worksheets submitted by GPU in response to IE Bulletin 79-01B. Portions of these were offered in the Restart Proceedings as UCS Exhibits 38 and 39.

14/ Letter to J. F. Stolz from H. D. Hukill, December 20, 1982, enclosure, unnumbered page 1.

pump must be seismically qualified. We now turn to that point. The Staff asserted that the Licensee's eleventh hour dispute over the need for diversity of motive power for EFW after an earthquake is a "novel" one -- an "interesting argument" that has not been "faced" before. Comm. Tr. at 33-34. This statement is misleading at best: the need for diversity of motive power was considered and resolved before the Standard Review Plan was written in 1975. Branch Technical Position ASB 10-1, "Design Guidelines for Auxiliary Feedwater System Pump Drive and Power Supply for Pressurized Water Reactor Plants" provides as follows:

> The auxiliary feedwater system functions as an engineered safety system because it is the only source of makeup water to the steam generators for decay heat removal when the main feedwater system becomes inoperable. It must, therefore, be designed to operate when needed, using the principles of redundancy and diversity in order to assure that it can function under postulated accident conditions. The majority of current systems are powered by electrical or steam-driven sources. Operating experience demonstrates that each type of motive power can be subject to a failure of the driving component itself, its source of energy, or the associated control system. The effects of such failures can be minimized by the utilization of diverse systems that include energy sources of at least two different and distinct types. Emphasis added.

Furthermore, as early as 1972, it was determined that GDC 2 calls for EFW systems to be seismically qualified. See Safety Guide 29, Seismic Design Classification, June 7, 1972. (This evolved into Regulatory Guide 1.29) This guidance applies on its face to the whole EFW system, as does the Standard Review Plan and has never been interpreted to allow certain portions of the EFW system to fail during an earthquake. See Comm. Tr. at 34.

Moreover, later versions of Regulatory Guide 1.29 state that the guide reflects "current NRC Staff practice" (not a departure) and that the method described for meeting GDC 2 and Appendix A of Part 100 "is being and will continue to be used in the evaluation of submittals" for operating licenses and construction permits. GPU seeks to be held to a lower standard than that which the AEC Staff determined is necessary ten years ago.

Finally, GPU's argument is a dangerous one. As noted by the Staff, EFW systems are, as a result of the TMI-2 accident, now supposed to be held to a higher standard of reliability than other systems. Comm. Tr. at 28, lines 6-9. In addition to being required to meet the GDC, they are subjected to reliability analyses. This was the same approach taken by the ASLB and is dictated by the extreme importance of reliable decay heat removal to public safety.

The ACRS, in testimony before Congress, stressed the large contribution which earthquakes make to the risk of serious accidents:

> The NRC research effort [on natural phenonena] is devoted chiefly to earthquakes, with a much smaller effort devoted to other natural phenomena; none of the current effort is devoted to the effects of man-made phenomena. The ACRS considers this distribution of effort to be appropriate in view of the much greater uncertainties associated with the frequency and magnitude of earthquakes and their effects on the structures and components of a nuclear power plant, and because of the potential for earthquakes to seek out inadequacies or mistakes in design or construction in all portions of a plant. Statement of Dr. Chester P. Siess, Advisory Committee on Reactor Safeguards before the Subcommittee on Energy and the Environment, House Committee on Interior and Insular Affairs, Feb. 21, 1979, p. 11, emphasis added.

The above-quoted observation regarding the propensity for earthquakes to "seek out" design or construction errors is an important one. The risk of this phenomenon is greatly heightened if there is not diversity in motive power. The probability that a common mode failure caused by or associated with the earthquake could disable all feedwater would be substantially increased. Considering, in addition, the "much greater uncertainties" noted by the ACRS with regard to the effects of earthquakes on nuclear plant structures and components, it would be gravely imprudent for NRC to give serious consideration to GPU's "novel" rationale. Indeed, we believe that this argument has been put forward as a blatant stalling tactic to induce the Commission to authorize restart while it has the argument under "consideration." NRC has already decided to order operating plants to backfit their EFW systems to three trains powered by diverse sources to ensure reliability. "Nine Licensees Are Targeted for Auxiliary Feedwater System Backfits" Inside NRC, December 27, 1982, p.1. See also Comm. Tr. at 32. GPU's position is plainly without merit. The operation of TMI-1 in its current condition poses a real hazard to public safety. GPU's vague and utterly unsupported assertion that its EFW system is "reliable" (Comm. Tr. at 19) hardly constitutes a basis for reasonable assurance of safety in the face of current evidence.

In this connection, it is important to recall that in March, 1979, NRC ordered the shutdown of five operating plants "to bring them into conformance with requirements for withstanding earthquakes." NRC Press Release 79-52, March 13, 1979. Three of

those plants went into operation before TMI-2. Surry Unit 1 (1972), Surry Unit 2 (1973) and Maine Yankee (1972). At that time, Mr. Denton stated the following:

> [I]t became apparent that a number of piping sytems had calculated stresses over the allowable value for the design basis earthquake. Also, for a few of these systems the more probable operating basis earthquake resulted in stresses above the allowable value. In addition, the structural integrity and functionability of pumps, valves and other essential equipment could be affected. The eastern United States is generally believed to be a region of low seismicity, when it is compared with the western part of the country. It is not, however, without significant historical seismic activity. The recurrence interval of the operating basis earthquake for these facilties [which included Beaver Valley Unit 1 in Pennsylvania] is on the order of 200-400 years. * * * [A]nalyses of a significant fraction of the affected piping system indicated that high stresses were calculated in a number of systems important to safety.
>
> Because the overstressing of piping and supports was predicted even for earthquakes which could reasonably be expected to occur during the lifetimes of these facilties, the problem took on considerable safety significance. Some of the systems identified as having overstressed conditions under earthquake loadings were part of the reactor coolant pressure boundary, whose failure could cause a loss of coolant accident. In addition, systems which would be needed to shut the plant down safely in the event of a loss of coolant accident were also affected. Thus an earthquake, of not extremely low likelihood, would have the potential both for causing an accident and for preventing safety systems, designed to cope with that accident, from operating. A secondary concern was whether or not systems needed to provide adequate long term cooling for the plant in the event of an earthquake without a LOCA could be assured. It was this 'common mode' effect that gave me the greatest concern for the safety of continued operation of these plants.
>
> Statement of Harold R. Denton, Director, Office of Nuclear Reactor Regulation before the House Committee on Interior and Insular Affairs, March 19, 1979, pages 5-6, emphasis added.

It appears that the situation facing the Commission with regard to the seismic capability of the TMI-1 EFW system is, in many respects, identical to the situation that was believed to exist at the time Mr. Denton ordered the five plants shut down. The only significant difference is that it is known that the TMI-1 EFW system presently is not capable of withstanding even an operating basis earthquake, an earthquake which could reasonably be expected to occur during the lifetime of TMI-1.

The Commission should also note that, in its most recent submission to the Commission, GPU excuses its failure to describe an alternate decay heat removal system, as required by the Generic Letter, on the grounds that "HPI cooling which uses only safety grade equipment can serve as an alternate decay heat removal system in the event both EFW and main feedwater systems are lost." H. D. Hukill to J. F. Stolz, Dec. 20, 1982. This is nothing more than feed and bleed. Incredibly, GPU fails to acknowledge that the Appeal Board has found that the record does not support a finding that feed and bleed is viable:

> [W]e agree with UCS that these tests [semiscale] raise serious concerns about the inability of the feed and bleed option. Even apart from those concerns, however, we are inclined toward the view that there is insufficient evidence of record to support the Licensing Board's conclusion that feed and bleed is a viable means of removing decay heat from the reactor core at TMI-1. Memorandum and Order, November 5, 1982, p. 6.

Thus, in mitigation of the problems with EFW, GPU seeks to rely on feed and bleed despite the fact that the Appeal Board has already found the record does not support the viability of that cooling mode. The utter inadequacy of this response is further

demonstrated by the fact that this precise argument was made by the Licensee and rejected by the AEC at the time TMI-1 applied for its operating license:

> The applicant stated...that disablement of the emergency feedwater system could be accepted because plant shutdown and cooldown could still be accomplished by using the high pressure injection system of the ECCS.
>
> The staff...notified the applicant that this approach, of accepting the possible loss of the emergency feedwater system, was not acceptably conservative.
>
> Safety Evaluation Report, U.S. Atomic Energy Commission, Docket 50-289, July 11, 1973, page 10-6, emphasis added.

THE REQUIREMENT FOR SEISMICALLY-QUALIFIED EMERGENCY FEEDWATER SYSTEMS HAS BEEN RECOGNIZED FOR A DECADE AND ITS IMPORTANCE IS A HIGH-PRIORITY LESSON LEARNED FROM THE TMI-2 ACCIDENT

At the Commission meeting, the Staff spokesmen seemed remarkably vague on the origin and importance of the requirement that EFW systems be seismically qualified. E.g., Comm. Tr. at 4-12. Commissioner Ahearne was particularly interested at the outset whether there is a rule requiring EFW to be seisimcally qualified for TMI-1. Mr. Denton stated that there is not. Comm. Tr. at 10. The answer does not seem to us to be so clear. We have shown above that, from June of 1972, tne AEC determined that EFW systems should be designed to seismic category 1 standards to meet GDC 2 and Appendix A to Part 100, both of which are NRC rules. Safety Guide 29, June 1972. TMI-1 was licensed in 1974. The February, 1976, revision of Regulatory Guide 1.29, which is a retitled version of Safety Guide 29, asserts that the guidance

"reflects current NRC Staff practice" and "is being and will continue to be used in the evaluation of submittals for operating license...applications..." Regulatory Guide 1.29, page 1.29-3. It was therefore recognized well before TMI-1 was licensed that EFW systems should be seismic category 1 in order to meet NRC rules. In our view, the question of whether TMI-1 was licensed in violation of then-current rules is probably unanswerable, given the typical vagueness of Licensee "commitments" and the vagaries of Staff review. It is, moreover, largely a diversion.

There can be no serious question that EFW systems should be fully seismically qualified. On June 10, 1980, over two and a half years ago, the ACRS wrote a letter to Mr. Dircks expressing its concern that the Staff's level of effort in reviewing the seismic qualification of EFW might be insufficient to ensure timely resolution. It recommended that the necessary manpower be committed "to assure completion of the Staff's short-term review in two or three months." See Milton Plesset to William J. Dircks, October 15, 1980. On June 10, 1980, the ACRS through Chairman Plesset also wrote to Chairman Ahearne as follows: "...development of a seismically qualified dedicated shutdown heat removal system is a project of which should be undertaken with a high priority." Four months later, the ACRS again wrote to Mr. Dircks, concluding that the Staff's estimates of the risk associated with interim operation of plants pending full seismic qualification of EFW systems "are large enough, if accurate, to warrant considerable priority by the NRC and the affected utilities." The Staff estimated the risk of a loss of shutdown heat removal from a

seismic event to be six to 15 times the estimated risk of core melt due to all causes for the PWR examined in WASH-1400. The ACRS concluded that "high priority should be given to resolution of this matter." Plesset to Dircks, October 15, 1980 at 2.

The Staff subsequently sent a letter to all PWR Licensees, presaging Generic Letter 81-14, which contains the following:

> After the accident at Three Mile Island (TMI), a large amount of our attention focused on the capability of plants to reliably remove shutdown decay heat. The NRC Action Plan (NUREG-0660, Section II.E) identifies post-TMI actions that are underway concerning this general subject. While we recognize that alternate ways may be available for removing decay heat following anticipated transients or accidents, removal of heat through the steam generators would be the first choice for accomplishing a safe plant shutdown. For this reason, the design of auxiliary feedwater (AFW) systems should satisfy the same standards applied to other safety related systems in the plant. Accordingly, the current acceptance criteria for AFW systems which are applied to construction permit and operating license reviews are contained in Section 10.4.9 of the NRC's Standard Review Plan (SRP), which treats the AFW system as an engineered safety feature. However, only the most recently licensed facilities have been reviewed against this section of the SRP. A copy of that SRP Section is attached as Enclosure 1. The purpose of this letter is to identify our generic concerns related to the seismic design capabilities of AFW systems in operating PWRs and to describe a program which we intend to undertake in reviewing the capability of operating PWRs to remove decay heat following an earthquake.
>
> D. G. Eisenhut to All Operating Pressurized Water Reactor Licensees, "Seismic Qualification of Auxiliary Feedwater Systems," Oct. 21, 1980, emphasis added.

The Staff's characteristic equivocation, while making it impossible to trace any particular moment in time when licensees of operating reactors may have been "required" to have a seismically

qualified EFW, cannot obscure the salient facts that 1) the importance of seismically qualified EFW is a direct lesson learned from TMI, if it was not learned before, 2) the risk associated with plant operation without seismically qualified EFW is relatively high and 3) this is a high priority safety problem repeatedly stressed by the ACRS.

Moreover, the Eisenhut letter of October 21, 1980 recognizes that there was an immediate need to determine whether it is safe to operate those plants which do not have a seismically qualified EFW in the interim while modifications are made. Eisenhut stated:

> We intend to complete a more detailed evaluation within the next several months to determine whether there is sufficient safety justification for long term operation until any required plant modifications have been completed. Id.

Two years later, we have been unable to find any evidence that this evaluation was done. There is no basis for concluding that TMI-1 can operate without unduly risking public safety.

## THE FINDING THAT THE TMI-1 EFW IS NOT SEISMICALLY QUALIFIED IS DIRECTLY RELEVANT TO THE ISSUES IN THE RESTART HEARING AND THEREFORE TO THE COMMISSION'S IMMEDIATE EFFECTIVENESS REVIEW

There are several reasons why the seismic qualification of the TMI-1 emergency feedwater system must be considered in deciding whether the "'short term actions' recommended by the Director of Nuclear Reactor Regulation...are necessary and sufficient to provide reasonable assurance that the Three Mile Island Unit 1 facility can be operated without endangering the health and safety of the public...." Order and Notice of Hearing, August 9, 1979, at 12. Among these reasons are the following:

1. The Licensing Board considered the issue in reaching its December 14, 1981 Partial Initial Decision recommending restart. See, e.g., Board Question 6b: "In what respects is the emergency feedwater system vulnerable to non-safety-grade system failures and to operator errors?" PID, paragraph 1005.

2. "The TMI-2 Lessons Learned Task Force noted that 'the need for an emergency feedwater system of high reliability is a clear lesson learned from the TMI-2 accident.'" PID, paragraph 1008, citing NUREG-0578, page 10.

3. The Licensee's testimony during the hearing is contradicted by its responses to Generic Letter 81-14 (TER Ref. 2). The Licensee, in its evaluation of the TMI-1 EFW system using the requirements of General Design Criterion 2, testified that "[t]he EFW piping system is however designed and qualified to the seismic Class I requirements." Lic. Ex. 15, Table 1, page 1. However, the TER, which is based on Licensee's responses to Generic Letter 81-14 (TER Refs. 3, 4, 5, 7, 8, 9), concludes that "the present level of seismic capability of the AFW system piping is less than OBE." TER, page 3.

4. The Licensee believes that its proposed modifications to the EFW system "will increase the reliability of the EFW system as discussed in ASLB-Partial Initial Decision Section Q dated December 14, 1981." TER, Ref. 7. Thus, Licensee has acknowledged that EFW reliability is at issue in the Restart proceedings. Moreover, Lawrence Livermore National Laboratory has concluded that the TMI-1 EFW system cannot even withstand an OBE much less an SSE. An OBE is "that earthquake which could reasonably be expected to affect the

plant site during the operating life of the plants." 10 CFR Part 100, App. A, III (d). This is essentially the same as an anticipated operational occurrence, which is "expected to occur one or more times during the life of the nuclear power unit...." 10 CFR Part 50, App. A, Definitions and Explanations. Thus, this is hardly a remote probability event; the occurrence of an earthquake which would result in failure of the TMI-1 EFW system is on a par with such events as loss of offsite power. It would be irresponsible for NRC to authorize restart when the EFW system cannot be expected to survive even an OBE.

5. The issue of whether feed and bleed cooling is "needed" (and thus must be demonstrated to be highly reliable) is the subject of Board Question 6.a and has become a central issue. Licensee still claims that total loss of feedwater is not a "design basis event," that feed and bleed is therefore not essential and thus, that its reliability or lack thereof is inconsequential. However, in testimony before the ASLB, GPU's witnesses admitted that if the EFW is incapable of withstanding an OBE or SSE, then total loss of feedwater would be a design basis accident. Tr. 5709 (Lanese).

GPU'S RESPONSE TO GENERIC LETTER 81-14 WAS DILATORY AND INADEQUATE

The Licensee's responses to Generic Letter 81-14 (TER Refs. 3, 4, 5, 7, 8 and 9) contain significant deficiencies. They also illustrate a pattern of delay on the part of GPU and the unwillingness of the Staff to follow the Commission guidance in CLI-80-21.

Generic Letter 81-14 was transmitted on February 10, 1981, and directed Licensees to provide the requested information within 120 days. The Staff noted that the information was needed in order to determine whether or not the "license should be modified, suspended, or revoked." TER Ref. 2 at 3. Contrary to the impression given by the Staff at the December 17 meeting (Comm. Tr. at 45), this language should unquestionably have conveyed a firm position.

GPU's first response was not provided until more than seven months later on September 29, 1981, and provided only a portion of the information requested. Missing from the response was information regarding the functional operability of EFW valves, power supplies and initiation and control equipment. TER Ref. 3 and enclosure. Then, in response to questions by the Staff, GPU promised to provide some of the missing information by December 31, 1981 (TER Ref. 4) -- specifically, evaluation of the seismic qualification of the electrical system associated with EFW. In addition, GPU promised to provide the required information on the non-seismic piping connected to the EFW suction piping by March 30, 1982, and on the functional operability of EFW valves by June 1, 1982. The information was, however, not provided by those dates.

In fact, GPU's next response did not occur until February 16, 1982. In that response, GPU identified many components required to perform the safety function of EFW which are not seismically qualified. TER Ref. 5. A letter of April 5, 1982 is the first record of any Staff response to GPU's failure to meet the 120-day schedule contained in the generic letter or to provide the

necessary information requested therein. In almost apologetic tones, the Staff reiterated those portions of the generic letter which, to that date, had been ignored by GPU. Further, the Staff noted that it was still "awaiting" receipt of information which the Licensee had "committed to provide" by March 30, 1982 and June 1, 1982. The Staff requested GPU to respond within 45 days. TER Ref. 6.

More than three months later, on July 7, 1982, Licensee reported that its evaluation of EFW valve operability during and following an SSE was not expected to be completed until September, 1982. TER Ref. 7. Some of that information was submitted on September 14, 1982, and the remainder on September 29, 1982. TER Refs. 8 and 9.

It appears, moreover, that neither the Staff nor Livermore is aware that there remain portions of the generic letter which GPU has never completely addressed. For example, the generic letter requested that for the non-seismically qualified portion of EFW, the Licensee should evaluate the potential for failure of other non-seismically qualified piping, equipment and components in the vicinity of the EFW to determine whether these failures could adversely impact on the EFW system. TER Ref. 2, Enclosure 2 at 2. We can find no response addressing this.

In addition, the generic letter directed licensees' evaluation to encompass the EFW system "and connected branch piping up to and including the second valve which is normally closed or capable of automatic closure when the safety function is required." TER Ref. 2, Enclosure 1 at 1. UCS has reviewed all of GPU's responses as

referenced in the SER and finds no discussion of automatic closure of any valves, which constitute the boundary of the EFW system and connected branch piping.

During the Commission session of December 17, 1982, Mr. Denton stated: "It is not my sense that this Licensee has been recalcitrant in these areas." Comm. Tr. at 15. In conveying this opinion, Mr. Denton, the highest-level official in NRC with direct responsibility for the safety of operating reactors, endorses the actions of a Licensee which took over a year and a half to respond to a 120-day deadline. Surely this cannot be acceptable to NRC. Even if one believes that GPU's new argument, surfacing first in December, 1982, regarding the need for the turbine-driven pump is a credible one (a proposition which UCS emphatically denies), it provides not the slightest excuse for treating the NRC's deadlines in so cavalier a manner for over a year and a half.

Indeed, this situation is strikingly reminiscent of the pattern of licensees' disregard for NRC directives combined with lax enforcement by the Staff in regard to the environmental qualification of safety equipment which was so strongly condemned by the Commission in CLI-80-21. The Staff was told that it must "not tolerate" precisely this type of response. Petition for Emergency and Remedial Action, CLI-80-21, 11 NRC 707, 713 (1980).

Moreover, GPU's responses to the generic letter are deficient in significant respects. Perhaps the most significant is that the method used by the Licensee in support of its claim that EFW valves will remain operable during and after an earthquake has long been discredited. Licensee first reported that "due to a lack of

information in the vendor's calculations, we cannot determine if these valves are qualified under SSE for functional operability during and after the earthquake." TER Ref. 3, Enclosure, unnumbered page 1. GPU apparently hired a contractor to evaluate this matter. TER Ref. 7. GPU later reported that its claim of the operability of the EFW valves was based on a "static analysis" which calculated "the seismically induced deformations of valve and operator parts which may impede valve operation and compar[ed] these calculated deformations to the available part clearances." TER Ref. 8 at 1-2.

Such static analyses were rejected in 1974 by the AEC Staff as a sufficent basis for demonstrating functional operability during and following an SSE:

> A test program is required to confirm the ability of all seismic Category I mechanical equipment to function as needed during and after an earthquake of magnitude up to and including the SSE.
>
> Analysis without testing is acceptable if structural integrity alone can assure the intended function. When a complete seismic test is impracticable, a combination of test and analysis is acceptable.
>
> U.S. Atomic Energy Commission, Regulatory Standard Review Plan, November 1974, page 3.9.2-3 - 3.9.2-4.

Furthermore, even if static analysis were theoretically acceptable, the Licensee reported only the bare results without any supporting documentation and no technical review could possibly have been undertaken to verify its conclusions. The only information given to Livermore were two tables with a column labelled "Adequacy Struct/Oper" into which the word "yes" was entered for every valve. TER Refs. 8 and 9, enclosed tables.

Thus, when Livermore purports to have "judged" (TER at 3) these valves to be qualified, it has in reality exercised no judgment whatever; it has simply repeated GPU's unsupported assertions.

Second, Livermore characterizes the diagram of the EFW system submitted by GPU as a "schematic sketch." TER at 2. Comparing that sketch to the piping flow diagrams of the actual systems contained in the Restart Report (Lic. Ex. 1) raises serious questions about whether, in fact, the evaluation performed by GPU was complete. For example, the piping for the EFW bearing cooling is not shown at all on any of the "sketches" submitted in response to the generic letter. In addition, the heating, ventilation and air conditioning systems which provide necessary cooling for the motor-driven EFW pumps, the nuclear services closed cycle cooling water piping which supplies cooling water to the EFW pump rooms ventilation equipment, and the nuclear service water piping which supplies river water to cool the nuclear services closed cycle cooling system heat exchangers are not mentioned in any of GPU's responses. Thus, while it is clear that Livermore has not considered these systems in its review, it remains unclear whether the Licensee has. The generic letter clearly encompasses "[a]ll mechanical and electrical equipment, piping (e.g., instrument air), conduits and cable trays which are necessary or contain items which are necessary, for the operation of the [E]FW system...." TER Ref. 2, Enclosure 1 at 1.

CONCLUSION

Contrary to the comforting generalities presented by the Staff and GPU to the Commission on December 17, 1982, UCS has demonstrated above that:

1. The lack of seismic qualification of the TMI-1 EFW system poses a substantial safety hazard;
2. GPU's assertion that its system is adequately reliable is wholly unsupported and contrary to the facts;
3. The requirement for seismically qualified emergency feedwater has been recognized for a decade and its importance is a high-priority lesson learned from the TMI-2 accident;
4. The finding that the TMI-1 EFW system cannot survive an earthquake is directly relevant to the issues in the Restart Hearing and to the Commission's immediate effectiveness review;
5. GPU's response to Generic Letter 81-14 was dilatory and substantively inadequate.

The NRC would violate its obligation to protect the public health by authorizing the operation of TMI-1 under these circumstances. Such operation would pose a palpable risk to the public. The Commission should rule that the TMI-1 EFW system must be seismically qualified as a precondition to operation.

In addition, UCS reasserts its objection to the continuing pattern of ex parte communication in this proceeding and moves again that any further Commission sessions involving oral

presentations concerning pending substantive issues by some of the parties to this case be governed by 10 CFR Part 2, Subpart G.

Respectfully Submitted,

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Dated: January 7, 1983

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NUCLEAR REGULATORY COMMISSION

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| In the Matter of | ) |
| | ) |
| METROPOLITAN EDISON COMPANY | ) |
| | ) |
| (Three Mile Island Nuclear Station, Unit No. 1) | ) |

Docket No. 50-289
(Restart)

## CERTIFICATE OF SERVICE

I hereby certify that copies of "UNION OF CONCERNED SCIENTISTS' COMMENTS ON THE COMMISSION'S EX PARTE MEETING OF DECEMBER 17, 1982 AND STATEMENT OF CONTINUING OBJECTION TO EX PARTE COMMUNICATIONS" have been served on the following persons by deposit in the United States mail, first class postage prepaid, this 7th day of January 1983.

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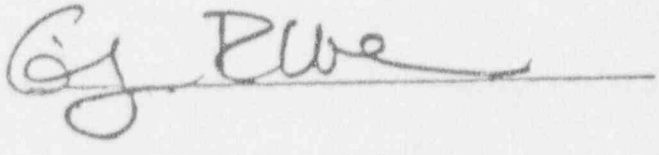

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ATTACHMENT 2

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