UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	
CONSUMERS POWER COMPANY	Docket Nos. 50-329 50-330
Midland Plant Units 1 and 2	

RESPONSIVE BRIEF OF CONSUMERS POWER COMPANY

In its Brief filed on June 13, 1977 ("Brief"), Consumers Power Company ("Licensee") set forth the substantive legal points and authorities which it believes govern this proceeding. This Responsive Brief will address those legal points raised by other parties and will also address allegations regarding the preparation of the testimony of Joseph G. Temple, which Intervenors have sought to interject into the substantive issues to be decided in these proceedings. Factual issues discussed in the other parties' briefs, except for those relating to the preparation of the Temple testimony, will be addressed in the Responsive Findings of Fact filed simultaneously with this Brief.

I. Legal Issues Raised By Other Parties

In its Brief at pages 6 and 20-24, Licensee set forth its position that the Nuclear Regulatory Commission (NRC) and thus, this Board is limited in its consideration of whether to continue, modify or suspend the construction permits for Midland (suspension hearing) to the issues remanded by the Court of Appeals. These remanded issues -- energy conservation, clarification of a report by the Advisory Committee on Reactor Safeguards (ACRS), environmental costs of waste disposal, restructuring the cost-benefit balance in view of the reconsideration of the fuel cycle and energy conservation issues, and any changed circumstances regarding Dow's need for process steam -- must also be considered in the suspension hearing within the confines of the equitable factors delineated by the NRC at page 9 of its General Statement of Policy dated August 13, 1976.

Intervenors, on the other hand, claim at page 8 of their Brief filed July 1, 1977 that the Court of Appeals "directed the Commission to reopen the entire license issue so that both safety and environmental matters could be given a full and proper consideration". Based on this analysis, Intervenors then claim on the same page that Licensee "does not now have, therefore, a valid construction license".*

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* Similarly, in Paragraph 1 of their Proposed Findings, Intervenors erroneously state that the Court of Appeals "reversed the Commission's grant of a construction license to Consumers Power. . . ." In point of fact, the Court was careful to remand without reversing. See p. 4 infra.

As will be shown below, this analysis is totally inaccurate.

Intervenors based their position on the following quote from the Aeschliman case*:

> As this matter requires remand and reopening of the issues of energy conservation alternatives as well as recalculation of costs and benefits, we assume that the Commission will take into account the changed circumstances regarding Dow's need for process steam, and the intended continued operation of Dow's fossil-fuel generating facilities. Id. at 632.

While this quote standing alone might be interpreted as a requirement by the Court of Appeals to restrike the entire cost benefit analysis, a review of the paragraph preceding the quoted text makes it clear that the Court was not requiring such an analysis. That paragraph states:

> The fuel cycle issues in these cases are controlled by Natural Resources Defense Council v. United States Nuclear Regulatory Commission, 178 U.S. App. D.C. ____, 547 F.2d 633, Nos. 74-1385 and 74-1586 (Decided today). The final EIS prepared in regard to Midland plant units 1 and 2 says only that fuel wastes will be shipped to unidentified offsite disposal areas. On remand, the Commission shall undertake appropriate consideration of waste disposal and other unaddressed fuel cycle issues, and restrike the cost-benefit analysis as necessary, in accordance with NRDC v. NRC, supra. (emphasis added). Ibid.

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* Aeschliman v. NRC, 547 F.2d 622 (D.C. Cir. 1976), cert. granted, 45 U.S.L.W. 3570 (February 22, 1976).

Thus, when the paragraph relied upon by Intervenors is put in context it is clear that the Court of Appeals was only requiring that (1) energy conservation be considered as an alternative to Midland, (2) the environmental cost of waste disposal be considered, (3) the cost-benefit be restructured in view of the fuel cycle and energy conservation analysis, and (4) the changed circumstances regarding Dow's need for process steam be considered.* Thus, it is clear that Intervenors' initial argument is incorrect. Once this initial argument falls, the conclusion that the Court of Appeals ruled that Licensee does not have a valid construction permit collapses for lack of support. In addition, the last sentence of that Court's decision makes clear that the argument is fallacious. That sentence states that "[t]he orders granting construction permits for the Midland reactors are hereby remanded for further proceedings in conformity with our opinion". Id. at 632.

The only other authority cited by Intervenors for the proposition that the entire cost-benefit analysis must be restructured is a decision by an Atomic Safety and Licensing Appeal Board (Appeal Board) which held that environmental questions should not be resolved on a set of facts existing

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* The requirement regarding clarification of the ACRS report was set forth in a different section of the Aeschliman decision and merely required that the report be returned to ACRS "for further elaboration of the cryptic reference to 'other problems'". Id. at 631. See page 5, infra.

in the past if there is good reason to believe they may have changed. Commonwealth Edison Co. (LaSalle County Nuclear Station Units 1 and 2), ALAB-153, 6 AEC 821, 823-24 (1973). Licensee agrees with the statement of law set forth by the Appeal Board and believes that the Board is complying with that guidance by resolving the remanded issues using current data. However, it is clear from the discussion by the Appeal Board in the LaSalle case as well as the discussion at page 6 of Licensee's Brief that this proposition cannot be used to enlarge the jurisdiction of the Board. Thus, it is clear that Intervenors' attempts to force a restructuring of the entire cost-benefit analysis are ill-founded.

With regard to their contention that the entire safety record must be reopened, Intervenors focus on two issues, ACRS and quality assurance. In fact, all the Court of Appeals required was that the ACRS report "be returned to the ACRS for clarification". Aeschliman at 632. Thus, the Court clearly did not call for any additional hearings on ACRS matters much less an entire review of safety issues. Licensee's brief sets forth at pages 18-20 the standards to be applied when and if Intervenors raise specific safety issues relating to ACRS. Finally, the Court of Appeals specifically declined to reverse the Commission on the issue of quality assurance. Id. n. 21 at p. 632. Consequently, as established at p. 6-7 of Licensee's brief, this Board has no jurisdiction to consider this issue. Therefore, Intervenors' attempts to force a reopening of the entire safety record are also ill-founded.

The second major point raised by Intervenors is that this Board must suspend construction unless it "can affirmatively find that there are no substantial and unresolved issues for determination in the remanded hearings, and that the ultimate cost-benefit analysis will not be affected by any of the facts now of record". Intervenors' Brief at page 13. In support of this proposition, Intervenors quote from a case involving a preliminary injunction as follows:

> . . . it will ordinarily be enough that the plaintiff has raised questions going to the merits so serious, substantial, difficult and doubtful, as to make them a fair ground for litigation and thus for more deliberate investigation. Hamilton Watch Co. v. Benrus Watch Co., 206 F.2d 738, 740 (2d Cir. 1953).

However, the full quotation from that case disposes of Intervenors' argument, for it states:

> To justify a temporary injunction it is not necessary that the plaintiff's right to a final decision, after a trial, be absolutely certain, wholly without doubt; if the other elements are present (i.e., the balance of hardships tips decidedly toward plaintiff), it will ordinarily be enough that the plaintiff has raised questions going to the merits so serious, substantial, difficult and doubtful, as to make them a fair ground for litigation and thus for more deliberate investigation. Id. (Footnotes omitted).

In the instant proceeding, the party with the burden of proof, as pointed out by the Staff and Intervenors, is the Licensee. Licensee's Findings of Fact and Conclusions of Law (Findings), establish that the most probable outcome of the remanded proceeding will be favorable to it, and that the balance of hardship (i.e. the injury which would result

from a suspension) tips decidedly in its favor. Thus, under this test it is clear that even if Intervenors wish to be cast in a position analogous to that of a plaintiff in a temporary injunction proceeding for purposes of raising questions going to the merits they cannot meet the necessary prerequisites to have this Board suspend construction. Additionally, this analysis by Intervenors of preliminary injunctions totally ignores the mechanism set up by the NRC and approved by the Court of Appeals to decide the question of continuation, modification or suspension of construction pending the completion of an environmental impact statement on issues remanded by an appellate tribunal. That process was originally set out by the Atomic Energy Commission in Appendix D to 10 CFR Part 50 and was modified and approved by the Court of Appeals in Coalition for Safe Nuclear Power v. AEC, 463 F.2d 954 (D.C. Cir. 1972). A complete analysis of the appropriate mechanism the Board must utilize is set forth at pages 20-24 of Licensee's Brief and will not be repeated here. Suffice it to say that this Board must balance each of the equitable factors set forth by the NRC in its General Statement of Policy, supra, in reaching its decision. Accord, Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2, CLI-77-8, 5 NRC 503 (March 31, 1977) Thus, Intervenors' argument as to the proper test for the Board to apply in deciding the suspension question is also ill-founded.

At this juncture it appears appropriate to address the point raised in footnote 35 of the Staff's Brief of

July 1, 1977, that the concept of probability of success on the merits should not be a controlling factor in the Board's decision. The Staff cites the NRC's Statement at page 521 of the Seabrook decision that the standards contained in Virginia Petroleum Jobbers Association v. FPC, 259 F.2d 921, 925 (D.C. Cir. 1958) do not apply when a decision is made on suspension. However, the Licensee has never relied on the standards set forth in Virginia Petroleum for the proposition that the factor of probability of success on the merits must be taken into account by this Board in reaching its decision. Indeed, at pages 29-30 of its Motion to Specify Issues . . . filed January 13, 1977, Licensee explicitly distinguished the Virginia Petroleum standards from the concepts it advocated that the Board must consider. In short, the cases cited therein and in Licensee's Brief at pages 31-38 clearly establish probability of success on the merits as one of the equitable factors referred to by the NRC in its General Statement of Policy which the Board must consider. Moreover, the NRC's decision in Seabrook did not reject this equitable factor, it merely rejected the more stringent standard imposed by Virginia Petroleum. Id. at 521. Finally, the Staff's concession that the Board must impliedly consider probability of success on the merits when it decides whether the equitable factors support continuation or suspension makes it clear

that the Staff's point is one of semantics rather than substance.

Intervenors' final argument is divided into two parts. The first, at page 16 of Intervenors' Brief, claims that "the public interest in a full and fair determination both of environmental cost-benefit issues and of safety related issues is pro tanto irreparably injured by each day of continued construction". The second argument also at pages 16-17 is that a halt of construction would not irreparably injure Licensee since sunk costs, including the cost of delay, cannot be considered by the Board in deciding the suspension question. Both of these propositions are ill-founded.

The first argument ignores the underlying basis for the equitable factor of "tilting the balance" which the Court in the Coalition case required the NRC to address. That Court stated:

> Since the decision reached on whether to go forward with the project depends, to some extent at least, on a balance of the environmental harm and the economic cost of abandonment, each additional increment to the amount of money invested in the project tilts the balance away from the side of environmental concerns. . . . On remand, the Commission should consider in detail whether this additional irretrievable commitment of substantial resources might affect the eventual decision reached on the N.E.P.A. review. The degree to which this expenditure might affect the outcome of the final N.E.P.A. process should be a paramount consideration in the decision on suspension reached after the hearings on remand. Id. at 956.

Thus, while that Court recognized the obvious, i.e., that each dollar spent would tilt the balance away from the side of environmental concerns, what it required the NRC to address was whether the outcome of the final environmental review might be affected by such an expenditure.* Licensee has not only established in this proceeding that continued construction will not affect the outcome of the final review by this Board (Licensee's Findings, paragraphs 96-109), it has also established that suspension of construction might well affect the outcome, since such a decision might force Dow to withdraw as a participant in the project.** (Licensee's Findings, paragraphs 55-58). Thus, Intervenors argument on this point is also ill-founded.

The second argument, that sunk costs and delay costs cannot be taken into account, can be disposed of by the language of the very cases which Intervenor cites in support of his proposition. The Court stated in Aeschliman, quoting the same Court in the Union of Concerned Scientists v. AEC, 499 F.2d 1069, 1084, n. 37 (D.C. Cir. 1974) that:

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* This charge is quite similar to the test set forth by the NRC at page 521 of the Seabrook case when it stated that a Board should consider whether suspension or continuation of construction might prejudice any further decisions that might be called for by the remand. Id. at 521.

** In addition, as established by the testimony of Mr. Boris, a suspension might well impact Licensee's ability to generate funds in the market place, which are necessary to fund Licensee's construction program. Tr. 4912 at pp. 5-6.

> An alternative to be considered is complete abandonment of the project, just as it was at both the construction and full-power operating license stages. [citation to record omitted]. As at those stages, sunk costs are not appropriately considered costs of abandonment, although replacement costs may be if construction of a substitute facility could reasonably be expected as a consequence of abandonment.

Thus, it is clear that in considering the cost of abandonment, "sunk costs", i.e., the total investment already made in a facility, cannot simply be added to the cost of an alternative. However, once a need for power has been established, replacement costs, i.e., the credits and debits which would result from abandoning one facility and building another to replace it, can be considered, since a substitute generating facility would have to be constructed. Replacement costs must be considered, and weighed against the costs of continuation of the project, in an incremental cost analysis so that these alternatives can be realistically compared on a current basis. To ignore replacement costs and to fail to do an incremental cost analysis would necessarily mean that any decision made to either proceed or not to proceed would emanate from an unrealistic and hypothetical basis. The NRC has adopted the approach of considering replacement costs and evaluating the alternatives on an incremental cost basis in its Seabrook decision.* Supra at pp. 521-530. Since

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* In its Brief and Findings, the Staff, after citing the Seabrook decision, consistently refers to the use of "sunk costs". An analysis of the references setting forth these costs indicate that the costs they refer to are more aptly described as replacement costs, with the alternatives viewed on an incremental cost basis.

Licensee has established a need for the facility (Licensee's Findings, paragraph 113(B)(1) and (2)), and properly considered replacement costs on an incremental cost basis in its abandonment analysis (Ibid. at paragraph 105), Intervenors' argument is ill-founded.

The only remaining legal issue which must be addressed arises from the Staff's statements at pages 16 and 17 of its Brief that the NEPA objections of Intervenors were timely raised and that the NEPA violation was "of some magnitude". Licensee does not agree with this analysis. For example, it is doubtful that the issue of energy conservation was timely raised. Indeed, in its Brief to the Supreme Court, the Solicitor General, speaking for the NRC, states:

> On January 24, 1974, the Commission carefully examined Saginaw's contentions and refused to reopen the Midland proceedings. App. 324-345. It decided that it was inappropriate to apply the Niagara decision retroactively in "the unfolding area of energy conservation" in light of the reliance of the parties on past practice and the consequent burdens that would result from a retroactive application of the new rule (App. 337). The Commission also contrasted the specific contentions made by the Niagara intervenors with Saginaw's "diffuse barrage" (App. 334) of 119 contentions containing 17 objections Saginaw identified for the first time in its motion for clarification as relating to energy conservation.
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> The Commission noted that, in contrast to the Niagara Licensing Board's refusal to consider evidence relating to energy conservation, the Midland Board had invited Saginaw to present evidence concerning or discuss the legal issues relating to substantially all 17 of the contentions it later identified as involving

> energy conservation, that Saginaw had failed to do so, and that the record supported the Board's ultimate rejection of each contention (App. 334-341). Consumers Power Company v. Aeschliman, No. 76-528. Brief for Federal Respondents at pp. 24-25.

From this, the Solicitor General argues that Intervenors did not adequately present the issues of energy conservation and that the record in the proceeding supported the Findings issued by the Board. Indeed, the Solicitor General argues in that Brief that the environmental review on all of the remanded issues was adequate. Thus, Licensee argues that it is doubtful that there was a NEPA violation in this case, and as a result, the impact is nonexistent and the timing of the objection irrelevant.

II. The Preparation of the Temple Testimony

Throughout this proceeding, Intervenors have alleged that Licensee was attempting to "suppress the facts" from the parties and the Board. As pointed out in Licensee's Findings and its Response to Invervenors' Filings dated June 27, 1977, many of these allegations rest upon Intervenors' own mischaracterization of documents and testimony. In their Brief, Intervenors now expand these allegations, reciting "the long-established rule that such conduct warrants 'the natural indeed, the inevitable, conclusion' that the guilty party has withheld evidence adverse to it". Intervenors' Brief pp. 3-4. From this, Intervenors conclude that construction should be halted. Licensee's response to this allegation will first discuss Intervenors' legal analysis

and then Intervenors' factual assertions and will demonstrate that both are incorrect.

A. Intervenors' Legal Analysis

Intervenors cite Alabama Power Co. v. FPC, 511 F.2d 383, 391 (D.C. Cir. 1974); Warner Barnes & Co. v. Kokosai Kisen Kabushiki Kaisha, 102 F.2d 450, 453 (2d Cir. 1939) and McCormick, Evidence § 337 (2d Ed. 1972), to support their proposition of law. Both of these cases rely on McCormick and §278 of Wigmore on Evidence (3rd ed., 1967) for support. For example, in the Alabama Power case, the Court stated:

> It is a familiar rule of evidence that a party having control of information bearing upon a disputed issue may be given the burden of bringing it forward and suffering an adverse inference from failure to do so. See McCormick, Evidence §337 at 787 ((2d ed. 1972). In regulatory proceedings, placing such a burden on the regulated firm, where the relevant information concerns its operations and management, has become part of the "common lore" of regulations. See Commonwealth of Puerto Rico v. FMC, 152 U.S.App.D.C. 28, 36, 468 F.2d 872, 880 (1972). Id. at p. 391, n 14.

However, the general rule is subject to a number of limitations. One such limitation is that the inference does not apply when the information is provided to another party through the discovery process. See McCormick, Evidence §337 at 787 n. 19. For example, in A.E. Staley Mfg. Co. v. Porto Rico Lighterage Co., 323 F.Supp. 27 (E.D. La. 1970), aff'd 438 F.2d 1 (5th Cir. 1971), the defendant attempted to invoke this assumption and the court denied that request stating:

> But we are not convinced that the above rule of law should be applied here. First, the cargo has had the benefit of and has employed the modern discovery methods established by the Federal Rules of Civil Procedure. Secondly, the cases in this area reviewed by us reflect that in each and every case the party seeking the aid of this rule of law was unable to obtain the information which was in the control and knowledge of the other party. It has not been suggested to us that there is any other evidence in the control and knowledge of the tug which it has failed to produce or which the plaintiff has failed to discover.* Id. at 37 (footnotes omitted).

In the instant case, the same rationale is applicable. This Board opened discovery in this proceeding on October 21, 1976. Licensee did not receive any discovery request from Intervenors until the first week of the evidentiary hearing. Tr. 93, 111-12, and 180. Indeed, the only request of Intervenors to any party was a letter request to Dow dated September 27, 1976 (See Attachment N to Licensee's Brief of December 30, 1976) in which Intervenors requested that "Dow be prepared to have available at said hearings the following. . . .** However, even in the absence of a discovery request, Licensee voluntarily made available to

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* See also, Hammond Packing Company v. State of Arkansas, 212 U.S. 322, 349-354 (1909).

** Indeed, during the first week of the hearing, Dow, pursuant to this informal request, produced such documents. Tr. 206-212 and 293-98.

all parties on November 3, 1976 the documents which formed the basis of its prepared testimony filed on November 5, 1976. These documents included copies of both Dow's and Licensee's correspondence, internal working papers, minutes of meetings which had occurred between them, as well as back-up documentation provided by Dow for its corporate decisions. These documents included Dow's and Licensee's minutes of the meeting of September 13, 1976 when the Michigan Division of Dow first stated to Licensee that the "Michigan Division negotiating group had concluded that there is no longer the possibility or probability that the nuclear project would be good for Dow's Midland plant", and that they had recommended that a corporate review be made of the Michigan Division's position. See Intervenors' proposed Exhibit 67 at p. 9. Licensee was also told "that it was important for them to recognize that there will be no official Dow position until the corporate review is completed" and that would take approximately 30 days.* Id. at p. 10. Thus, even though additional documents were provided pursuant to Intervenors' oral discovery requests at the hearing, the parties had available to them by November 3, 1976 all major documents setting forth all of the information which they claim Licensee attempted to suppress. Thus, to argue that,

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* The corporate review resulted in a decision not to accept the Michigan Division position.

even though such documents were produced during discovery, the entire case of Licensee is somehow tainted is absurd.

Indeed, the above factual recitation combined with the facts (1) that Dow's corporate position, which was contrary to the Michigan Division position, was communicated to Licensee on September 27, 1976 (See Licensee Ex. 24), (2) the Dow corporate position was communicated to the NRC in Licensee's brief of September 29, 1976 and (3) the subsequent decision by Dow made the Michigan Division's interim position immaterial (See pages 10-17 of Licensee's Brief of June 13, 1977) to the issues in this proceeding, make it clear that Licensee's conduct has been fair, honest and totally candid.

Indeed, no party to this proceeding has argued that the Dow corporate position is not the material issue before the Board. Intervenors have argued at pages 18-19 of their Brief that Mr. Temple and Mr. Orrefice "create" the corporate position and as such "made it clear in their testimony, moreover, that they spoke not for themselves alone, but in ways reflecting their understanding of the consensus of the Dow management". Through this argument Intervenors apparently hope to qualify Mr. Orrefice's and Mr. Temple's personal opinions as material to the Dow corporate position. To support this proposition, Intervenors cite cases which establish that a corporation may be deposed through an officer or a managing agent. This is indeed a correct statement of the law. However, it does not address the

question of whether the personal opinions of an employee, whether he is a managing agent or not, are material to a position taken by the corporation. The short answer, as established in Licensee's Brief, at pages 10-12, is that while Mr. Temple and Mr. Orrefice are certainly qualified to set forth and discuss Dow's corporate position, their personal opinions are immaterial to the question of Dow's corporate position.

The final point to be made is that the Dow corporate position has been consistently set forth and reaffirmed throughout the course of this proceeding. The Dow corporate position states:

> [A]t the present time circumstances have not changed sufficiently to call for a modification of Dow's commitment to nuclear produced steam to be supplied by Consumers Power in March Of 1982. Under the present circumstances as known to Dow, the nuclear alternative remains the most attractive one economically. Further, the matter will be kept under continuous review and Dow will keep all of its options open. Tr. 220 at p. 2-3.

This position was first set forth by Licensee in its Responsive Brief of September 29, 1976, was reiterated in the Temple testimony provided to the parties on November 5, 1976 and sworn to by Mr. Temple on November 30, 1976, was restated during examination of Mr. Temple at Tr. 2584 and by Mr. Orrefice at Tr. 2689, was reaffirmed by Dow's Supplemental Answers to Interrogatories dated May 2, 1977 and was confirmed by Dow in its Findings. Thus, since the Dow corporate

position has been consistently set forth in this proceeding, and since the documents underlying that position were provided to the parties, Intervenors' legal argument that Licensee's entire case is tainted because it withheld information adverse to it is ill-founded and must be rejected.

B. Factual Allegations Underlying Intervenors' Legal Argument on the Preparation of the Temple Testimony

Having disposed of Intervenors' legal arguments and established that no taint attaches to Licensee's evidentiary presentation because of Intervenors' allegations regarding the preparation of the Temple testimony, Licensee now turns to a very brief discussion of those allegations.* First, we would point out that this Board has indicated that it will consider the matter of the preparation of the Temple testimony as a separate matter upon conclusion of its consideration of the substantive issues presented at the suspension proceeding. Intervenors' transparent attempt to drag that matter into the decision on whether or not to suspend is simply another of the red herrings which they have attempted to foist upon this Board.

Licensee has established at pages 9-17 of its Memorandum of December 30, 1976, that the preparation of the

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* Although it does not believe the matters discussed in this section of its Brief are in any way relevant and material to the substantive issues to be decided by this Board, Licensee cannot leave the charges made by Intervenors without response.

Temple testimony was a product of discussions between Mr. Temple, the Dow attorneys and Licensee's attorneys.* It also established at pages 23-31 of that Memorandum that the Michigan Division interim position was not a material fact which was required to be presented in the direct testimony of Mr. Temple and, at pages 21-23, that the participation of Licensee's attorneys in the preparation of the testimony was proper.

Intervenors' argument to the contrary is based primarily on a set of notes prepared by Mr. Lee Nute, one of Dow's counsel, of a meeting between Dow and Licensee on September 21, 1976 (Intervenors' Exhibit 25). Licensee has objected to the Admission of these notes since they were not sworn to or subject to cross-examination. Additionally, they were written and typed sometime after the meeting had taken place and the original handwritten notes which served as a partial basis for the document were destroyed. Tr. 2244-46. These facts are of some import since there exist two other sets of notes of Dow employees present at the meeting in question, which do not reflect the major points relied upon by Intervenors in their argument. Compare the notes of Mr. Hanes, Intervenors' proposed Exhibit 71 and the notes of Mr. Klomparens, Item 17 of Licensee's conditional

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* The subsequent release of the "Duran" notes by Dow on February 1, 1977 buttress this position. Licensee notes that the "Duran" notes of September 29, 1977 were conditionally offered by Licensee as item 11 in its Motion Requesting Admission of Exhibits dated June 7, 1977.

request for admission of Exhibits dated June 7, 1977. Licensee does not believe that Mr. Nute's notes accurately record the discussion which occurred at that meeting. In any event, if the Board so desires, these underlying factual questions can be dealt with at a later time and are of no moment in deciding the issues presently before the Board.

Intervenors' first allegation (Brief, p. 3) is that Licensee attempted to "finesse" its dispute with Dow by trying "to present a witness ignorant of the facts." Even if Licensee, in the course of a discussion on September 21, 1976, prior to the time that the Dow corporate position had even been formulated, suggested the possiblity of using another witness, such a discussion cannot be considered the taking of an action intended to deceive this Board in the face of a record which shows that Licensee presented Mr. Temple as the witness and voluntarily produced documents setting forth the Michigan Division's interim position prior to the time that the hearing was convened.

Intervenors' next allegation (Brief, p. 3) is that Licensee attempted to "'blackmail' Dow into submission with threats of litigation." This allegation is undermined by the fact that Licensee, through its top executive officer and counsel, told Dow that, whatever decision Dow made, it must tell the truth. Licensee's Exhibit 29 (Temple hand-written notes), Tr. 2661-62 and Duran notes of September 29, 1976. In addition, as any businessman knows, one of the risks of doing business is litigation. It is difficult to

believe that anyone would not consider it obvious that, in a situation where Licensee was requested to attend a meeting to present its views on the impact upon it of Dow continuing with or withdrawing from a project as to which a contract existed, Licensee would state that if the contract was breached, Licensee would sue. Hardly blackmail; more a statement of the obvious. When viewed in context, Intervenors' allegation on this point is likewise baseless.

Intervenors' next allegation (Brief, p. 3) is that Licensee tried to "suppress the facts through preparing testimony which Dow called 'disingenuous' and its own witness branded as dishonest".* First, the statement regarding disingenuity referred to a prior "initial draft" of testimony which was quite different from the testimony as submitted to this Board (Attachment K of Licensee's Response of December 30, 1976 and L. F. Nute's notes of 10/29/76 telephone conversation identified as Item 16 in Dow's letter of 12/7/76) and which was prepared for discussion with Dow in an attempt to organize the facts in a cohesive fashion (Licensee Response of December 30, 1976 at p. 13). Second, it is extremely difficult to suppress facts when all of the underlying documentation containing the facts supposedly

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* That during the course of discussions with Dow's and Licensee's counsel, Mr. Temple expressed himself as believing that his "personal feelings" were not a matter of consequence to this proceeding, and that both Dow's counsel and Licensee's counsel agreed that they were not relevant or material is established at page 3 of L. F. Nute's notes of the meeting of September 29, 1976 identified as item 14 in Licensee's conditional request to admit Exhibits.

suppressed is voluntarily provided to the parties. See pp. 14-19, supra. Third, Licensee's analysis at pp. 9-17 of its Brief of December 30, 1976, of the preparation of Mr. Temple's testimony is buttressed by the later release of the "Duran" notes by Dow in February of 1977.*

At any rate, the following facts are clear:

1. Joseph Temple was presented as the Dow witness;

2. Joseph Temple was instructed by Licensee to tell the truth and he did so;

3. The Dow corporate position was accurately set forth in the testimony; and

4. The underlying documents setting forth the information which Intervenors claim Licensee attempted to suppress were made available to the parties.

Thus, regardless of statements allegedly made prior to September 29, 1976, Licensee's actions in preparing and presenting the Temple testimony were proper. Intervenors' factual arguments are simply unsupported and unsupportable.

C. Other Factual Allegations Underlying Intervenors' Arguments

Some additional factual allegations made by Intervenors should be addressed by Licensee even though they do not appear to directly relate to Intervenors' legal argument

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* The comment regarding disingenuity and the letter in which it appears should be read in light of Mr. Wessel's (special trial counsel to Dow) comments at Tr. 664-680.

that Licensee's conduct has tainted the presentation of its entire case.

The first such allegation appears at pages 1 and 2 of Intervenors' Brief where they state that during the year since the Court of Appeals' mandate issued Consumers had "deliberately raced ahead" with construction, because "[t]hey feel that the more the plant that is built the less likely it becomes that it will be stopped". Two points belie this statement. One, as shown in Licensee's Exhibit 5, the construction expenditures for the last quarter of 1976 were based on the 1976 budget, which was determined prior to the Court of Appeals' decision, and the 1977 expenditures are consistent with the level of expenditures in 1976, demonstrating that Licensee has not deliberately "raced ahead" building Midland. Second, the statement regarding how much of the plant was built was allegedly made in 1975 prior to the Court of Appeals' decision in this case,* and related to the Court's delay in rendering a decision. Therefore, it cannot be used to establish the intent of Licensee with regard to this proceeding. Indeed, Licensee has continuously urged and taken positive steps to conclude this proceeding at the earliest possible date.

The next allegation by Intervenors, also found at page 2 of their Brief, is that Licensee has attempted to

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* As set forth in Licensee's Objections to Exhibits, Intervenors never provided a proper foundation for this document so there was no opportunity to test its credibility.

prolong this proceeding because "as long as construction continues Consumers has a lever". To support this proposition, Intervenors cite out of context a portion of a sentence in their proposed Exhibit 25 (to which Licensee has objected due to lack of proper foundation). To the contrary, the record is clear that it has been Licensee which has consistently pushed for schedules to complete both the suspension and the remanded hearings at the earliest possible date. See, Brief of Consumers Power Company dated September 29, 1976; and Motion and Memorandum for an Order Establishing Definite Procedures, dated December 13, 1976. It was Licensee who objected to the numerous continuances requested by Intervenors which caused this proceeding to drag out from October 1976 to July, 1977. In fact, Licensee currently has pending a motion, which Intervenors have opposed, to establish a schedule to complete the entire proceeding by December 31, 1977. In short, there is no substance to this allegation.

Intervenors' allegation with regard to Licensee "preparing" the Staff in this proceeding is nothing more than laughable. They attempt to twist a simple conference between attorneys in order to expedite discovery procedures into something sinister. This allegation should be given short shrift by the Board.

III. Conclusion

Based on the foregoing, Licensee respectfully requests that this Board reject Intervenors' fallacious legal arguments and their equally fallacious underlying factual allegations, and apply the legal standards set forth by Licensee in its Brief of June 13, 1977 in reaching a decision in this proceeding.

Respectfully submitted,

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July 14, 1977

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter Of	)	
CONSUMERS POWER COMPANY	)	Docket Nos. 50-329
	)	50-330
(Midland Plant, Units 1 and 2)	)	

RESPONSIVE FINDINGS OF CONSUMERS POWER COMPANY

1. Consumers Power Company (Licensee) filed its Findings of Fact and Conclusions of Law (Findings) in this proceeding on June 13, 1977. The Findings of The Dow Chemical Company (Dow), Intervenors and the Nuclear Regulatory Commission (NRC) Staff (Staff) were filed on June 21, 1977, July 1, 1977, and July 1, 1977 respectively.* Licensee's Responsive Findings will not reiterate its Findings, but will respond affirmatively to the Findings of the other parties. Since Intervenors are the only party which opposes continuation of the construction permits for Midland, Units 1 and 2 , the majority of these Responsive Findings will address factors raised in Intervenors' Findings.

* Licensee did not receive the Staff findings until July 7, 1977.

In reviewing Intervenors' Findings, Licensee discovered a number of apparent errors in Intervenors' supporting cites to the record. These errors include cites to lawyer's arguments, portions of statements taken out of context and record cites which do not support the proposition for which they are cited. In the time available to Licensee, it was not possible to point out all of these apparent errors. Therefore, Licensee would suggest that the Board and the other parties use some care in relying upon Intervenors' record cites.

I. Dow's Need for Process Steam and the Intended Operation of its Fossil Fueled Facilities.

A. Dow's Obligations as Affected by the 1974 Contracts

2. Contrary to the implications in Paragraph 5 of Intervenors' Findings, Dow's obligations to purchase process steam from the Midland Plant were not reduced by the contract, executed in 1975 and still in effect, which superseded the 1967 initial steam proposal. Whereas there was no minimum requirement for steam in the initial steam proposal, Dow is currently obligated to take at least 2,000,000 pounds per hour of 175 psig steam. There is no minimum requirement for 600 psig steam.[1/] Furthermore, based on formal notification procedures under Section 12 of the Steam Contract, Dow has indicated its desire to reserve capacities of 2,400,000 pounds per hour of 175 psig steam and 400,000 pounds per hour of 600 psig steam for 1982.[2/] Although

Dow is no longer required by the contract to close down its fossil-fueled facilities, Dow testified that it intends to shut down its antiquated units as soon as possible after a reliable source of process steam is available.[3] As far as electricity requirements are concerned, the initial electric proposal provided for Licensee to supply all of Dow's electrical needs, up to 400,000 KW, while the present electric contract provides for Licensee to supply electric energy as auxiliary or standby to Dow's existing generating facilities with a contract demand established at 300,000 KW.[4] However, as Dow has said that it expects to cease operating its own units as soon as a reliable source of process steam is in place, this provision of the current contract will be of no practical significance beyond the date of retirement of the existing Dow units.[5] In 1974, the then Atomic Energy Commission (AEC) reviewed these contracts, which are still in force, and determined that, contrary to the allegations of Intervenors, there were no "changed circumstances" which warranted a reopening of the construction permit proceedings for the Midland Plant.[6] The AEC stated: "We think it sufficient to note that Dow has a contractual commitment to purchase large quantities of process steam from the completed facility, that substantial purchases of electricity are also contemplated, and that Dow's existing fossil-fueled facilities are to be maintained primarily on a stand-by basis."[7] Today, Dow remains contractually committed to purchase large quantities of

process steam, intends to purchase approximately 300,000 KW of electricity, and, importantly, has stated its intent to shut down its antiqudated fossil-fueled facilities.[8/]

B. The Dow Corporate Position Vis-a-Vis the Dow-Licensee Contracts

3. Intervenors have expended a great deal of effort and numerous pages of their Findings in an unsuccessful attempt to show that Dow's commitment to the Midland Plant is less than firm. See Paragraphs 40, 42-51 and 29-33 of Intervenors' Findings. Despite Intervenors' attempts to muddy the record, a fair examination of the record demonstrates clearly that Dow has every intention of living up to its contractual obligations to Licensee.[9/]

4. The contractual relationship between Dow and Licensee was formally reviewed by a Dow executive group in a "corporate review" in September, 1976, at the request of Dow's Michigan Division.[10/] The corporate review was undertaken by the Operating Board of Dow Chemical USA, the entity with jurisdiction over the affairs of the Michigan Division.[11/] Preparation for the review by a task force of the Operating Board included an analysis of the economics of various alternatives, which was presented to the Board.[12/] The smokescreen created by the Intervenors' Findings cannot cloud the fact that the result of this corporate review, as stated in testimony filed on November 5, 1976 and sworn to

on November 30, 1976, was a corporate conclusion that circumstances had not changed sufficiently to call for a modification of Dow's commitment to nuclear-produced steam supplied by Licensee in March 1982, and that under presently known circumstances, the nuclear plant was Dow's most economically attractive alternative.[13] Dow expressly stated its intention to purchase process steam from Licensee beginning the first year of operation of Midland Unit No. 1.[14]

5. Dow witness Paul F. Orrefice, a member of the Dow corporate review team, stated on the stand that he could not divorce the two factors which influenced the final Dow decision, the economic advantage that the Midland Plant had for Dow and the possibility of a $600 million lawsuit.[15] This stands in sharp contrast to Intervenors' charge that Dow's support of the Midland Plant "rests principally if not exclusively on Consumers' litigation threats," Intervenors' Findings at Paragraph 51. Furthermore, Dow never communicated to Licensee that a perceived "lawsuit threat" was the basis for Dow's decision to support the Midland Plant.[16] Dow's repeated statements that it is keeping its "options open" do not evidence a lack of support for the nuclear project, but rather relate to the normal and prudent business practice of reviewing decisions in the event that the underlying facts change.[17] When testifying at the hearing in February, 1977, Mr. Orrefice stated that he knew of no facts which would change the decision the corporate review team had reached the previous September.[18]

This position was reaffirmed in Dow's supplemental response to Interrogatories dated May 2, 1977 and in its Findings filed on June 21, 1977. Intervenors place great weight on the personal opinions of Joseph G. Temple with regard to the Midland Plant, expressed in his capacity as former head of Dow's Michigan Division. See, Intervenors' Findings at Paragraphs 46 and 51. However, as Licensee demonstrated in its June 13, 1977 Brief, it is the corporate position in support of the Midland Plant taken by the Operating Board of Dow Chemical USA which is of evidentiary value, for this is the entity with jurisdiction over the affairs of the Michigan Division.[19/] It must be noted that the Michigan Division decision was never the decision of the Dow corporate review team,[20/] and that none of the Dow USA Operating Board members specifically agreed with any of the Michigan Division's conclusions regarding the Midland Plant.[21/] The personal opinions and speculations of Mr. Temple, speaking either for himself or for the Michigan Division, were made known to the Dow, USA Operating Board which then rejected the interim position of the Michigan Division.[22/] Consequently, they are not material to the issue of Dow's corporate intent to purchase process steam from Midland. Furthermore, the record is clear that Mr. Temple does not know why the Dow corporate review team reached the decision it did, thus his speculations on the subject are meaningless.[23/] In addition, Mr. Temple has stated that he has no protlem accepting and supporting the decision of the Dow corporate review team.[24/] For similar reasons, the personal opinions

In addition, Dow witnesses have consistently stated Dow's intent to comply with its contractual obligations, Licensee's Findings, Paragraphs 50-59. As Licensee has explained in its Briefs of January 13 and June 13, 1977, this Board has neither the duty nor the authority to go beyond this testimony to question the validity of the contracts or to make some sort of predictive finding as to Dow's future behavior vis-a-vis the contract.[27/] Intervenors, on the other hand, in paragraphs 40, and 42-51 would have this Board make a predictive finding as to the future behavior of Dow with regard to its contractual relationship with Licensee. However, as pointed out at pages 16-17 of Licensee's Brief of June 13, 1977, "any ultimate factual finding that the construction permits should be revoked, based on the Boards prediction about Dow's future behavior, would be contrary to the facts in this proceeding and would therefore be improper as not supported by substantial evidence. See, Anglo-Canadian Shipping Co., Ltd. v. Federal Maritime Comm'n., 310 F.2d 606 (9th Cir. 1962); the Morgan v. United States, 298 U.S. 468 (1936)". Thus, Intervenors' attempt to have this Board make some sort of predictive finding as to the future behavior of Dow should be rejected.

D. The Effect of Suspension Upon Dow

7. Intervenors have asserted in their Findings that a suspension of construction of the Midland Plant will not have an adverse impact upon Dow or affect its position vis-a-vis the nuclear project. Intervenors' Findings Paragraphs

and speculations of Mr. Orrefice as to whether Dow would sign the contract with Licensee today, cited by Intervenors in Paragraph 47 of their Findings, are without evidentiary value.[25/] As Dow indicated in its Further Responses to Interrogatories of February 28, 1977, whether it would not contract for steam and electricity from Midland is a hypothetical question which cannot be answered and which is not before Dow or this Board. Dow's corporate position on the question of the significance of personal opinions was also expressed in those same responses to interrogatories, which stated that "[n]o person in Dow's employ has any authority or power to change this position (i.e. the Dow corporate position)".

The Dow corporate position to support the Midland Plant has been repeatedly reaffirmed since the original testimony was filed on November 5, 1976. As recently as May 2, 1977, Dow has emphatically reiterated the fact that it has no intention of breaching its contractual obligation to Licensee.[26/] See Licensee's Findings, Paragraphs 53-59.

C. The Board's Jurisdiction to Examine the Dow-Licensee Relationship

6. Licensee's Findings have established that Dow needs the process steam and electricity to be produced by the Midland Plant, see Licensee's Findings, Paragraphs 50-59 and Dow's Findings, Paragraph 2. The contracts between Dow and Licensee demonstrate Dow's intent to purchase its process steam and electricity from the Midland Plant, Licensee's Findings, Paragraphs 50-59 and Dow's Findings Paragraph 4.

43, 51. These bald statements fly in the face of reality. It is undisputed that Dow is presently operating its fossil-fueled facilities under a Consent Order with the Michigan Air Pollution Control Commission (MAPCC) which expires on July 1, 1980.[28/] If Dow's existing power facilities are to be operated beyond July 1, 1980, either an additional variance from the MAPCC will be required or Dow will need to reduce its emissions to comply with all applicable Michigan emission regulations.[29/] Dow can upgrade its fossil-fueled facilities in order to make them operational, in accordance with state and federal air pollution regulations, through 1982 (the year in which the Midland plant is scheduled to begin to supply steam to Dow) or through 1984 (the latest date at which Dow facilities can operate safely, economically and reliably).[30/] However, a delay of the Midland Plant beyond 1982 will result in substantial additional expense to Dow due to the need to continue the use of its more costly existing fossil fuel units, which will burn higher cost oil as a fuel, instead of being able to purchase less expensive process steam from Midland and electricity from Licensee, Dow's Findings, Paragraph 6; Dow's Response of January 25, 1977 to Intervenors' Interrogatory No. 8 of December 27, 1976.

8. Dow stated that, if the Midland Plant is not in commercial operation by the end of 1984, it will be forced to obtain its steam and electricity requirements from other sources, and may build its own facilities for this purpose.[31/]

Dow has also stated that, because it requires considerable lead time to construct alternative generating facilities, it must make any decision to adopt such a course of action well in advance of the present 1981 and 1982 scheduled commercial operation dates of the Midland Plant.[32/] Thus, Dow stated that a suspension of construction would have serious implications for Dow, for a suspension would cause additional expense and create uncertainty as to whether the operating dates of the Midland Plant would be delayed beyond the end of 1984; therefore, a suspension may force Dow to abandon the preferred nuclear alternative.[33/] Accordingly Dow has expressed great concern over the possibility that construction of the Midland Plant may be suspended,[34/] and has stated that it cannot live with such uncertainty.[35/]

E. Economic Advantage of the Nuclear Alternative to Dow

9. Intervenors' Findings have attempted to show, virtually without support, that the economic advantage of the Midland Plant to Dow is "tenuous if not nonexistent," Intervenors' Findings, Paragraph 46. However, the Dow USA Operating Board concluded, as Mr. Orrefice repeadedly stated, that the nuclear alternative was economically advantageous to Dow.[36/] Mr. Orrefice further testified that nothing had happened since the review to change that conclusion.[37/] Furthermore, Licensee has performed an independent analysis of the comparative costs to Dow of nuclear and coal-fired alternatives.[38/] This calculation, which utilizes Dow's

data but corrects certain errors contained in Dow's original analysis, demonstrates that Dow has understated the cost of its coal-fired alternative by $22 million per year.[39] When consideration is given to more realistic coal cost numbers and proper techniques are used in calculating levelized annual costs, the cost advantage for the nuclear alternative exceeds $70 million per year even at the lowest return on investment considered by Dow (15%).[40] If a comparison is made on the basis of the higher return on investment considered by Dow (30%), the nuclear alternative will save Dow $117 million per year over the coal alternative.[41]

10. Even if the tremendous economic advantage to Dow of the Midland Plant is put aside for the moment, Intervenors' argument in this "cost-benefit" area is still without merit, for it rests on an incorrect interpretation of the National Environmental Policy Act (NEPA), Intervenors' Findings, Paragraphs 47 and 51. Apparently, Intervenors believe that the purpose of the NEPA cost-benefit analysis in this case is to determine whether the Midland Plant will be beneficial to Dow. This is simply not the case. NEPA was enacted to ensure that the costs and benefits to the environment, and thus to the public interest in general, were considered before a major federal action was undertaken.[42] As an Atomic Safety and Licensing Appeal Board has stated, "[t]he purpose of NEPA was not to ensure that utilities do what best serves their economic self-interest. They can be trusted to do that on their own".[43] The same can be said

of Dow. Thus attempting a cost-benefit analysis of the Midland Plant from Dow's point of view is totally irrelevant to this proceeding. Furthermore, another Appeal Board has remarked that, although the Commission's (and therefore this Board's) regulatory authority is broad, it "does not, however, extend (outside the antitrust area at least) to the over-

sight of business judgments which do not have either safety or environmental implications."[44/] In short, it is not for this Board to review the economic basis of Dow's business judgment that the Midland project is economically advantageous to it. Rather, this Board must determine whether after balancing the costs and benefits, supplying the needed steam and electricity from Midland serves the public interest.

11. In summary, Licensee has demonstrated that Dow needs the process steam from the Midland Plant and electricity from Licensee's system and that Dow intends to live up to its contractual obligations to Licensee to purchase that steam and electricity. The fact that the nuclear project will be economically advantageous to Dow, as demonstrated by Licensee, reinforces the conclusion that Dow will fulfill its contracts with Licensee. Although the Midland Plant is not projected to be in commercial operation until 1981 and 1982, Dow is negotiating with the MAPCC as to the operating status of its fossil-fueled units after 1980. Dow can upgrade its present facilities so as to be operational through 1984, thus allowing it to continue operation until steam is available from Midland. However, Dow has testified

that it cannot live with uncertainty as to the commercial operation dates of the Midland Plant. Thus a suspension of construction would have adverse impacts upon Dow.

II. Licensee's Ability to Finance the Midland Plant and the Cost and Schedule of the Project.

12. Intervenors have contended in Paragraphs 48 and 51 of their findings that there is serious doubt as to whether Licensee can finance the Midland Plant. This conclusion is premised upon a series of misconceptions of reality and outright distortions of the record. Contrary to Intervenors' allegations, Licensee is fully able to finance the construction of the Midland Plant without regard to whether or not the Michigan Public Service Commission grants Licensee the requested rate of return or allows it to make certain accounting changes, whether or not part of Midland's generating capacity is sold to electric cooperatives and municipalities, and whether or not Dow makes an "interest-free loan" of any amount to Licensee.[45/] Even assuming that none of the events postulated above occur, Licensee could finance its entire electric construction program with increased use of moderate amounts of unsecured debt and preference securities.[46/] Furthermore, Licensee's short term bank credit availability of over $220,000,000 could be used to permit timing of entry into the securities markets.[47/] Intervenors' charges that this is not the case are simply not founded upon the facts. Intervenors allege that they base their conclusions in part on pages 1 and 2 of Licensee's 1976 Annual Report which

are not in evidence, since Intervenors only offered page 4 of that document as their Exhibit 57. Tr. 6193-94. However, even overlooking this evidentiary point, it is clear that pages 1 and 2 of the Annual Report merely state the obvious - that utilities need prompt rate relief under current economic conditions from Public Service Commissions in order to cover increases in costs. References to the testimony of NRC Staff witness Arnold H. Meltz in Intervenors' Findings at Paragraph 48 do not support Intervenors' position. Mr. Meltz stated, for example, that Licensee's 12.6% rate of return on common equity in 1976 was significantly better than the industry average[47/] and concluded that the financing of the Midland Plant by Licensee "appears attainable".[48/] Furthermore, Mr. Meltz emphasized that the factors which may affect the financing of the plant are not unique to Licensee, but are constraints faced by all regulated investor-owned electric utilities.[49/]

13. Intervenors' Findings make repeated reference to Dow's perceptions vis-a-vis Licensee's ability to finance the Midland Plant and maintain the construction schedule, see Intervenors' Findings, Paragraphs 48-50. This is but another instance of Intervenors introducing a non-issue into this proceeding. The testimony of Dow witnesses properly goes to but a limited issue in this hearing, i.e., Dow's need for process steam and electricity, Dow's intention to purchase this steam from Midland and electricity from Licensee,

and Dow's intention regarding the future operation of its existing fossil fuel facilities. Beyond this area, the speculations of Dow witnesses are irrelevant.[50] Whereas the ability of Licensee to finance the nuclear project and to meet the construction schedule may be considered relevant issues in this proceeding, the beliefs of Dow personnel as to Licensee's ability to do so have no evidentiary value whatsoever, especially when Dow's vague statements are contradicted by the testimony of witnesses who have analyzed Licensee's financial ability and construction schedule in depth.[51]

14. While Intervenors attack Licensee's cost estimate for the Midland Plant of $1.67 billion, Intervenors' Findings, Paragraph 46, they do not cite to any hard evidence which would disprove the reasonableness of that figure. Licensee has demonstrated both the reasonableness of the $1.67 billion figure and the propriety of rejecting Bechtel's cost increase figure of $90 million.[52] Mr. Orrefice has testified that no one on the Dow corporate review team which analyzed the $90 million cost increase informed him that it was considered significant in terms of Dow's assessment of the economic advantage of the Midland Plant,[53] and Dow's supplemental interrogatory responses of February 28, 1977 state that it has been advised of no changes which would require a new analysis. Intervenors similarly fail to bring forward any evidence which would negate Licensee's findings that Licensee can meet its construction schedule.[54] Intervenors' witness

merely engaged in unfounded speculation that since Licensee had encountered financial difficulty in 1974, he thought it could be expected to encounter difficulty in the future. This speculation was made without any reference to Licensee's much improved financial position.

III. ACRS Issues

15. Intervenors have asserted that the requirement of the Court of Appeals in Aeschliman that the Advisory Committee on Reactor Safeguards (ACRS) letter of June 18, 1970 relating to the Midland plant be clarified for further elaboration of the reference to "other probelms related to large water reactors" has not been satisfied, Intervenors' Findings, Paragraphs 52-57. To the contrary, the ACRS letter of November 18, 1976 (superseded by letter of November 23, 1976 and further explained by letter of December 1, 1976) completely fulfills the mandate of Aeschliman, for the ACRS specified the eleven items which were referred to in the original ACRS letter as "other problems", and provided an amplifying statement for each item based on ACRS reports on other similar nuclear plants which had been reviewed during the months prior to the Committee's review of the Midland Plant.[55/] These statements provide the "short explanation, understandable to a layman" of the matters related to the Midland Plant that the Court of Appeals intended.[56/] It should be noted that this clarification of the 1970 Midland ACRS letter is all that was required by Aeschliman; that decision neither directed nor anticipated that hearings would be held to

consider the items listed in the clarified letter or any other ACRS issue.[57/]

16. Ignoring the true issue which the Court of Appeals remanded to the NRC regarding the ACRS, the explication of the "other problems" language, Intervenors again create a false issue by injecting into this proceeding questions regarding the meaning of "due consideration" in the 1970 ACRS letter and the time at which ACRS items will be resolved, Intervenors' Findings, Paragraph 53. As these topics are not raised by the clarified ACRS letter, there is no support in Aeshcliman for the proposition that they should be considered by this Board at either the suspension or the remand hearings. Thus Intervenors' Findings related to these non-issues are irrelevant and should be disregarded.

17. Intervenors, at Paragraph 55 of their Findings, also refer to the initial decision in Tennessee Valley Authority (Hartsville Nuclear Plant, Units 1A, 2A, 1B and 2B), LBP-77-__, 5 NRC __ (April 28, 1977) in which two Board members, in a separate section of the decision, criticized ACRS letters for failing to "advise whether specific unresolved items must be resolved prior to the issuance of a construction permit or an operating license."[58/] Again, this question goes beyond the scope of the matter remanded in Aeschliman and indeed, would ask more of the ACRS than they are required to do by statute.[59/]

18. In citing testimony related to the cost of resolving ACRS items, Intervenors flagrantly distort the record to their own advantage, Intervenors' Findings, Paragraph 53.

After quoting from the testimony of NRC Staff witness Lawrence Crocker, who stated that he could not say how much it would cost to resolve the ACRS items, Intervenors assert that "Consumers' Mr. Keeley agreed. Tr. 3711-12, 3718-19, 3756-58," Intervenors' Findings, Paragraph 53 at p. 67. Nothing could be further from the truth, and nothing in the transcript pages Intervenors cite supports this blatant misrepresentation. Mr. Keeley testified quite clearly that the budget for the Midland Plant includes a $10 million allowance to implement various regulatory guides which resolve some of the ACRS items, and $24 million for "a future agency trend allowance", which is the estimated cost of effectuating future regulatory guides and the resolution of pending ACRS items.[60/] These figures are estimating numbers based on Licensee's past experience.[61/] As Licensee demonstrated in its findings, both the cost and schedule of the Midland Plant take into account the past and future resolution of the ACRS items, and continued construction of the plant will not foreclose design alternatives for those items.[62/]

19. In drawing its conclusion of the ACRS issue, Intervenors make the astounding statement, again unsupported, that "Aeschliman contemplates a de novo consideration of safety", Intervenors' Findings, Paragraph 57. Such off-hand comments tossed into a conclusion of law without a scintilla of foundation cannot be given any weight by this Board.

IV. QA/QC

20. Not content to have this Board confront those issues remanded by the Court of Appeals, Intervenors attempt to resurrect the long dead Quality Assurance/Quality Control (QA/QC) question, Intervenors' Findings, Paragraphs 56-57. As Licensee has repeatedly demonstrated, the authority of the Commission and therefore of the Board, is limited to those issues remanded by the Aeschliman decision.[63/] The Court in that case said specifically:

> We conclude that the Appeal Board's treatment of the "quality assurance" and "quality control" requirements was adequate, and, particularly in light of the considerations and conditions set out in its orders, should not now be set aside. 547 F.2d at 632 n. 20.

In view of this unambiguous language, Intervenors' efforts to raise the QA/QC issue in this proceeding cannot succeed.

21. To bolster their untenable position, Intervenors cite an Appeal Board decision which emphasizes a Board's obligation to act on currently available information.[64/] While Licensee admits the validity of this principle, the point to keep in view is that this Board does have all the currently available information pertaining to the issues which are properly a part of this proceeding. Intervenors cannot utilize the need to have current information in order to bootstrap extraneous issues into this hearing. A second spurious argument made by Intervenors in this area is that a Board has an obligation "to deal with QA/QC problems as they occur," citing Duquesne Light Co. (Beaver Valley Power

Station, Unit 1), ALAB-408, 5 NRC ___ (June 2, 1977), slip op. at 8. Beaver Valley involved an Appeal Board review of a decision authorizing full power operation of one unit of a reactor. In discussing the extent of a Licensing Board's jurisdiction in an operating license proceeding, reference was made to the established principle that that Board may raise issues, such as QA/QC, on its own prerogative pursuant to 10 C.F.R. §2.760a.[65/] The opinion went on to say that the Appeal Board had a duty to take into account, during its review of the decision granting the operating license, "extraordinary developments" which, though they transpire during the course of its review, have a bearing on whether the operating license should have been issued.[66/] Licensee does not dispute this duty, but believes that it has no application in a suspension hearing at which very limited issues have been assigned to this Board.[67/] Nor does Beaver Valley require a Board to delve into new areas merely because a hearing is taking place.[68/]

22. As for Intervenors' substantive attacks on Licensee's QA/QC program, Intervenors' Findings, Paragraphs 56-57, specifically the liner plate and tendon sheathing problems, the short answer is that these are two examples of a QA/QC program functioning as it should. It was Licensee's QA/QC procedures, not the Commission's Office of Inspection and Enforcement as Intervenors imply, which were responsible for discovering the linear plate bulging and improper and omitted tendon sheaths, and notifying the NRC.[69/] Problems

will always occur in a large and complex construction project; the salient point is that Licensee's QA/QC program has demonstrated that it is capable of identifying and correcting construction errors.

23. In a footnote on page 70, Intervenors cite a May 27, 1977 article from the Midland Daily News, indentified as Intervenors' Exhibit 79 and moved for admission into evidence simultaneously with the filing of Findings, for the proposition that the repair of the liner plate bulge may cost more than $800,000. Aside from the fact that newspaper articles are the most blatant form of hearsay and are hardly appropriate to be relied upon to prove the truth of the assertions stated therein,[70/] this footnote ignores the fact that Licensee informed this Board and the parties by letter on March 14, 1977 that because of the nature of the incident, the cost of repair may be covered either partially or completely by insurance.

V. Fuel Cycle Issue

24. Intervenors' Findings do not reach a conclusion on whether the fuel cycle issues will have a significant effect on the cost-benefit analysis for the Midland Plant, Intervenors' Findings, Paragraph 58. However, Licensee has already demonstrated in its Findings that, due to the enormous economic advantage of the nuclear plant over a coal alternative, and in view of the Commission's guidance

that it appears unlikely that the use of the new values in the interim fuel cycle rule could tilt a cost-benefit balance, the cost-benefit balance for the Midland Plant will not be tilted away from the alternative of abandonment by consideration of the interim fuel cycle rule.[71/]

25. In referring to the discussion which must take place at the remand hearings concerning the fuel cycle issues, Intervenors again confuse the cost-benefit analysis of the project mandated by NEPA with Dow's independent analysis of nuclear versus fossil alternatives. As Licensee has shown in Paragraph 9 supra, NEPA was not designed to protect the economic self-interest of corporations, which can be expected to look out for their own best interests before venturing into a business deal.[72/] Thus, the possible impact of fuel cycle matters upon Dow is irrelevant to this proceeding.

VI. Need For Power

A. Licensee's Load Forecasts

26. Intervenors contend that Licensee's load forecasts, both long and short-term, are inaccurate and lacking in foundation, and thus suggest that it cannot be found that energy conservation measures are unlikely to obviate the need for some or all of the electricity to be produced by the Midland Plant, Intervenors' Findings, Paragraphs 59-68. Before explaining why Licensee's forecasting procedures are proper, and its forecasts reasonable, it is necessary to point out that in this area the credibility of Intervenors'

Findings is particularly low. First, Intervenors show a misunderstanding of this subject area, and their Findings are replete with inaccuracies, distortions, and claims which are based on material not in the record of this proceeding. The starting point of Intervenors' Findings is a discussion of the "short-term Budget Forecast," which Intervenors refer to as Midland Intervenors' Exhibit 11, Intervenors' Findings, Paragraphs 60 and 61. The Exhibit is actually a long-term forecast, Licensee's "confirmatory analysis," a fact apparent from the face of the document, its substance, the testimony regarding it, and even its identification by Intervenors' counsel.[73/] This fact alone destroys the attempted import of Intervenors' Findings, Paragraphs 60 through 64. However, further confusion and distortions are apparent. Intervenors calculations appear to be based on the assumption that Licensee projects a 5.2% growth rate beginning from 1977 through 1985 (Intervenors' Findings, Paragraphs 60 and 63), when in fact Licensee projects this growth rate beginning after 1977 through 1986.[74/] Intervenors' claim that Licensee conceded that growth may be lower during 1978-1982 (Intervenors' Findings, Paragraph 60) distorts a witness' statement that there was a possibility of a decline in economic activity between 1978-81.[75/] Intervenors also exhibit misconceptions with their interpretation of the fact that the Energy Forecast Executive Review Committee members (EFERC) believed there to be "only" a 50% likelihood that Licensee's annual growth rate will equal 5% per year, Intervenors' Findings, Paragraph 66. The import of the EFERC's conclusion is that there is a

50% chance that the growth rate will be higher and a 50% chance it will be lower. Thus, Licensee has selected a value which gives the company an approximate 50% probability of being able to meet its expected load in the future.[76/]

27. Intervenors also repeatedly mischaracterize documents for their own advantage. For example, there is a claim that an exhibit shows that Licensee's economist foresees no net change in state population, when in fact the document only reports the position of the Michigan Department of Management and Budget, without adopting it, agreeing with it, or even commenting upon it, Intervenors' Findings, Paragraph 67.[77/] Intervenors claim that the same exhibit contains a conclusion that General Motors energy consumption will lessen; the document contains no references to energy consumption, only a statement that more vehicles will be assembled in plants outside Michigan.[78/] Intervenors' supporting citation here[79/] also points out another tactic used in Intervenors' Findings, that is, the citation to lawyer's argument, which cannot sustain a finding of fact. This tactic occurs at various times, including the asserted transportation industry's commitment to reduce energy consumption by a certain amount[80/] (Intervenors' Findings, Paragraph 67); the claim that Licensee's computer runs anticipate significant and timely rate increases[81/] (Intervenors' Findings, Paragraph 62); and the assertion as to Licensee's standard error of estimate[82/] (Intervenors' Findings, Paragraph 63).

28. Intervenors also claim support from various legislative proposals or federal programs which are never actually made of record, but only vaguely characterized by counsel, assumed efficacious, and claimed to show that Licensee's load forecast is inaccurate, Intervenors' Findings, Paragraphs 61, 62, 65 and 67. There are references to the "Federal Energy Administration's program to increase the efficiency of home appliances" (Intervenors' Findings, Paragraph 61), "the Administration's recently announced energy program" (Intervenors' Findings, Paragraphs 61 and 62), and the "Industrial Energy Conservation Program of the Federal Energy Administration" (Intervenors' Findings, Paragraphs 65 and 67).[83] In particular, Intervenors' method of introducing the effects of the "Administration's energy program" into this proceeding has been less than proper and not extremely convincing.* In considering the impact of increases in the price of electricity on demand, Intervenors state that, "It is common knowledge (cf. Rule 201(b) of the Federal Rules of Evidence) that price increases are a major component of the Administration's energy program . . ." Intervenors' Findings, Paragraph 62. This is stretching the concept of judicial (or administrative) notice far beyond what the drafters of Rule 201(b) ever contemplated.[84]

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* Intervenors have not gone beyond presenting "a description" of this unadopted program, Intervenors' Findings, Paragraph 61 at note p. 76, referring to Intervenors' Exhibit 61.

29. The credibility of Intervenors' witness in the area of load forecasting has also been seriously called into question. Intervenors' witness purported to be the author of various studies including econometric load forecasting techniques which he claimed were exemplary.[85/] Actually, he had limited experience in econometric modeling for purposes of energy forecasts, as Voir Dire showed that he was not in fact the principal author of the studies,[86/] and he stated that he was unfamiliar with an econometric forecast model cited in one of them.[87/] In addition, Intervenors' witness had no previous experience in developing an econometric model for energy forecasting,[88/] nor had any of the other developers of the forecast studies presented ever before worked through this type of model.[89/] These first attempts were met with limited success; as a result of public review of the initial study which used a purely econometric modeling approach, extensive modifications were made in the final report, including the placing of less emphasis on econometrics, and the projected growth rate increased from essentially 0% in the initial econometric study to approximately 3% in the final report.[90/] In any event, a forecasting model developed for one region cannot be transferred to another region.[91/]

30. In addition to limited experience, Intervenors show a lack of familiarity with Licensee's system based on a superficial review of it. Intervenors attempted no independent forecast of Licensee's service area,[92/] did not check others' models or their results in relation to Licensee's forecast,[93/] and Intervenors' witness could not even say

what models had been reviewed in the NRC Staff's evaluation.[94] His analysis has been shown to be partial and misleading.[95]

31. In contrast, the results of Licensee's forecasts have been validated by at least three different econometric models.[96] An additional econometric model, identified by and prepared for the NRC Staff, which evaluates on a statewide basis by customer class, forecasts a growth rate for 1975-1990 slightly higher than the total MECS forecast.[97] Contrary to Intervenors' misleading statements, the study done by the Michigan Governor's Advisory Commission on Electric Power Alternatives (GACEPA) supports Licensee's forecast, for the GACEPA medium growth projection for Licensee's system is 5.26% annually,[98] an extremely close correlation with Licensee's projected 5.2% per year,[99] Intervenors' Findings, Paragraph 66. The GACEPA figure of 4.9% quoted by Intervenors is not comparable to Licensee's 5.2% projection as it represents growth in the combined Licensee-Detroit Edison Service Area.[100] GACEPA's "low growth" scenario of 3.4% includes a predicted recession in 1977-1978, and was not adopted by GACEPA, because it was considered unreasonable.[101] In fact, GACEPA considered the "medium growth scenario of 5.26% to be slightly downward biased.[102] Intervenors cite to the Federal Energy Administration's (FEA) projected sales growth rate (Intervenors' Findings, Paragraph 66), but the FEA projects peak loads to grow at 5.29% per year,[103] and it is peak loads which determine generation requirements.[104] Licensee conserva-

tively assumes peak load to grow at the same rate as sales.[105] The Michigan Public Service Commission (MPSC) forecast also supports Licensee's forecast.[106]

32. Intervenors' criticism of the methodology of Licensee's long-term forecast developed by probability encoding as being heavily subjective and lacking consideration of relevant factors is not to the point, Intervenors' Findings, Paragraph 65. The official forecast developed by the probability encoding technique has a solid basis and was confirmed by a forecast using a complex mathematical approach.[107] All forecasting is in fact based on subjective judgment, as was confirmed by Intervenors' own witness with regard to the "econometric" approach.[108] There is serious question about the improvement in forecast results that can be made by the use of an econometric approach.[109] Intervenors miscite Staff witness Dr. Feld; he did not contend that it is impossible to determine whether the forecast results are reliable, but in fact considers Licensee's 5.2% per year growth projection to be reasonable.[110]

33. Intervenors contention that many of the data inputs to Licensee's forecast analysis appear to be out of date (Intervenors' Findings, Paragraph 65), ignores the fact that Licensee's forecasting is a continual operation, for which Licensee constantly gathers information and revises previous studies.[111] At the end of January, 1977, Licensee's witness Bickel testified that he had reviewed the long-term forecast study within the last two months and had made some

minor adjustments. For the most part, however, the results were still very valid.[112]

34. Intervenors at various times question Licensee's load forecast as not adequately including price effects, Intervenors' Findings, Paragraphs 61, 62, 64, 65 and 67. It is true that Licensee's forecast is not tied to a specific price elasticity quotient. However, Licensee does not contend that price will not have an effect on growth, and the effects of price have been adequately reflected in Licensee's forecast.[113] Moreover, other econometric models confirming Licensee's forecast did include specific price elasticity quotients.[114] It is important to note that it is particularly difficult to differentiate between reactions to price and reactions to other factors.[115] Also, unprecedented price changes could not be accurately modeled by a specific quotient.[116] It is particularly difficult to develop accurate price elasticities.[117] Most importantly, there have been wide variations in calculated elasticities for price.[118] The NRC Staff's review of 15 econometric models shows that estimates of long-run price elasticities applicable to long-term forecasts range dramatically.[119] Thus, residential customer-related price elasticities ranged from -0.22 to -1.33, commercial from -.08 to -1.50, and industrial elasticities from -0.5 to -2.37. The total elasticities thus varied widely from -0.55 to -1.24.[120] Given such variation, it is in fact wiser not to adopt a price elasticity quotient for which a good statistical fit cannot be established.[121]

35. Intervenors contend that Licensee has ignored recent national level government policies regarding energy conservation, including energy use efficiency, and that Licensee's forecast is thereby invalidated, Intervenors' Findings, Paragraphs 61, 62 and 65. Aside from the fact that Intervenors' references to such policies are entirely vague, see Paragraph 28, supra, Licensee has shown that the effects of energy conservation, including governmental standards, have been fully incorporated in its forecast, and it has also been shown that legislative standards affecting energy use could not be adequately modeled by an econometric technique.[122/]

36. Intervenors next contend that the "verifying study" of the long-term forecast undertaken by Licensee has serious deficiencies, Intervenors' Findings, Paragraph 67. Initially, Intervenors' lack of credibility in this area, as shown supra Paragraph 26, should be recalled. First, Intervenors' criticism of the assumption of a 21.4% increase in residential space heating use between 1977-1985 again demonstrates their lack of understanding of the subject area, Intervenors' Findings, Paragraph 67. Residential space heating use is expected to increase because there will be more customers using residential space heating and more of these customers will be year-round, as opposed to seasonal,[123/] and therefore there is no conflict with a per customer decline in usage rate as Intervenors assert. No specific quotient regarding changes in real personal income

is used because it has not been possible to obtain a good statistical relationship using disposable income as an independent variable and residential domestic average use as a dependent variable.[124]

37. Intervenors' comments on Licensee's industrial forecast contain numerous misconceptions, Intervenors' Findings, Paragraph 67. For instance, Intervenors contend that Licensee ignored the impact of the FEA's Industrial Energy Conservation Program, even though Dow is committed to it. The demand figures utilized for Dow are based on discussions between Licensee and Dow so that any such commitment by Dow has been implicitly included in the forecast.[125] Furthermore, a Dow witness has stated that Dow's commitment is to reduce its energy per unit of output, not reduce its use of electricity.[126] Thus, this commitment could result in a switch to the use of electricity from other forms of energy.[127] Intervenors' criticisms of the General Motors (GM) component of the industrial forecast are similarly unfounded, Intervenors' Findings, Paragraph 67. While it is correct that Licensee used vehicles and time as independent variables in the equation and did not include the price of electricity as an independent variable in the equation used in computing GM's demand, Licensee did so because there has been a better statistical fit using vehicles and time rather than using price.[128] Similarly, Licensee has found through experience that it is not valid to correlate KWh/per vehicle

with the percentage of cars versus trucks produced; thus, Licensee does not project sales to GM accounts on that basis.[129/] Licensee's projection of an increase in energy consumption per vehicle is not surprising in view of a trend toward increasing numbers of KWh per vehicle.[130/] As far as energy conservation measures by GM are concerned, Licensee's study reflects conservation programs by GM as well as price elasticity.[131/] Furthermore, while GM is making an effort to cut back on the amount of energy used per vehicle, Licensee's expert believes that GM will switch some uses of oil and gas to electricity.[132/] In addition, GM's response to Licensee's Load Management Survey (Intervenors' Findings, Paragraph 67) states that improvements in reducing electricity usage, although important, represent a small portion of the total GM energy savings.[133/]

38. Evaluation by outside experts has supported Licensee's forecasting methodology.[134/] Those forecasts confirming the results of Licensee's forecast also have specifically calculated various elasticities, including ones for price.[135/] The model developed by GACEPA specifically for the MECS System identifies elasticities of price, income and population, and industrial output by major customer class.[136/] The FEA's regional econometric model also includes various elasticities.[137/] Elasticities derived by and used in the forecast model developed for the NRC Staff include ones for the price of electricity and other energy sources, population, personal income, and value added.[138/]

39. It must be remembered that the purpose of sales forecasting is to project what will be the demand on a system in the long-term future so as to derive a time frame of need for a generating unit, and that it is therefore the result of the forecasting analysis that is essential.[139] Licensee's forecast predicts a result that is reasonable and includes consideration of relevant factors such as conservation.[140] Intervenors have not seriously challenged this result by their essentially nonconclusory assertions at Intervenors' Findings, Paragraphs 60-68.

B. Reliability and Reserve Requirements

40. Intervenors challenge Licensee's contention that the Midland Plant is needed to come into commercial operation on the scheduled dates in 1981 and 1982 in order to assure that Licensee will meet its Loss of Load probability criterion ("LOLP") of one day in ten years, Intervenors' Findings, Paragraphs 69-73. The basis for Intervenors' criticism is two-fold: Intervenors claim that Licensee could achieve the 20% installed capacity reserve considered necessary to meet its LOLP without the Midland Plant; Intervenors also contend that the 20% reserve requirement is overstated.

41. First, Intervenors challenge Licensee's inclusion of Dow demand in the analysis of projected peak demand, asserting that a delay in the on-line dates of the Midland Units would alter the demand placed by Dow on Licensee's system and thereby increase Licensee's projected installed

capacity reserves as shown on Licensee Exhibit 11, Intervenors' Findings, Paragraph 70. Intervenors' analysis is faulty in many respects. Licensee's analysis shows the effect on installed capacity reserves of delaying the Midland Units based on projected load and generating capability for 1981 through 1984.[141/] Intervenors inaccurately contend that Licensee does not challenge that the calculation of Licensee Exhibit 11 was erroneous, Intervenors' Findings, note at p. 90; to the contrary, Licensee has supplied Dow with auxiliary and backup power in the past, and would continue to do so in the future so that some Dow needs are properly considered in any case.[142/] Intervenors' analysis by definition ignores Dow's power requirements in the event of Midland unavailability, not including any of Dow's energy requirements in their "Midland abandonment" case analysis.[143/] Thus, Intervenors ignore the underlying reasons for Licensee's analysis of capacity reserves, i.e., to show the need for generating capacity to serve loads of both Dow and Licensee.

42. Even if the amount of Dow load were to be reduced if the Midland Units were not in service as scheduled, Intervenors have not shown, as they claim to have done, the differences that would occur in Licensee's load forecast.[144/] The portion of Licensee's projected load attributable to Dow's energy requirements, included in its current load forecast which is the foundation for the testimony in this proceeding, is of record[145/] but was purposefully not used by Intervenors in the reduction of loads in the Midland

delay and abandonment cases.[146] Intervenors ignored the information used by Licensee in preparing its forecast, choosing instead data produced by Dow on January 28, 1977, long after the preparation of the forecast, and unrelated to it.[147] In each year examined, Intervenors chose to deduct a greater amount of load in the event of a Midland delay than Licensee included in its forecast, thereby showing an unwarranted increase in the installed reserve figures.[148] In fact, even the lowest Dow demand case used by Intervenors, that of a 15-month Midland delay, shows higher demands by Dow than Licensee included in its forecast in every year but one.[149]

43. In addition to using Dow's instead of Licensee's data, Intervenors further manipulate the data by doing a series of calculations using Dow's information regarding total electric energy purchases rather than using that given by Dow regarding its peak demand,[150] despite the fact that both Licensee's and Intervenors' primary analyses of capacity reserves are based on peak load.[151] Even if Intervenors had used only data provided by Dow, if they had used the data showing peak demand, their analysis would have shown deductions in only one year, 1981, of 10 Mw in the "9 month delay" case and of 90 Mw in the "15 month delay" case.[152]

Intervenors claim to use Dow's estimate of its demand in the "cancel Midland" case, Intervenors' Findings, Paragraph 70 at p. 89, but there is in fact no such estimate made by Dow.[153] The errors are apparent: For example, in 1983 Dow shows a peak demand of 200 Mw in the base case, Licensee's load forecast included 190 Mw, but Intervenors' analysis deducts a total of 227 Mw in the "Midland not added" case.[154] Using the data included in Licensee's load forecast, there would only be an amount of 5 Mw of the Dow demand which is asserted to be contingent on Midland availability in 1981, rather than the 122 Mw deducted by Intervenors.[155] Nevertheless, Intervenors consider the differences between the two sets of data to be insignificant, Intervenors' Findings, note to Paragraph 70 at p. 90.[156] In connection with the use of "total electric energy use" rather than "demand" figures, Intervenors also incorrectly deducted Dow energy demand totaling 61 Mw during January through May 1982 from a Licensee summer peak load occurring after that time.[157]

44. When reducing Dow loads by incorrect figures, Intervenors amplify the error by using incorrect load and efficiency factors.[158] First, Intervenors divide Dow energy use by a system load factor of 67%,[159] rather than Dow's actual load factor, which is closer to 100%.[160] Although Intervenors' witness did not initially recognize it, this information was available from the data actually

used by him, as well as other portions of the record in this proceeding.[161] Use of the lower load factor introduces an error of up to 25% in the calculations, always in the direction of overstating the reduced demand.[162] Second, the amount of the error is further increased by Intervenors' use of the system efficiency factor to convert Dow purchase to Licensee's total generation requirements[163] rather than the efficiency factor particularly applicable to Dow, a difference apparent to anyone with a knowledge of the method of transmission to industrial customers.[164] Intervenors' claim that the recalculations were performed using the same assumptions and procedures used by Licensee (Intervenors' Findings, note to Paragraph 70 at pp. 89-90) is inaccurate.[165] Licensee's analysis is based on forecasted peak demand which is calculated based on the aggregate total load and therefore the average load and efficiency factors;[166] recalculation by an original calculation method is obviously inappropriate if significant parameters are changed.

45. Second, Intervenors contend that Licensee may have inaccurately projected installed reserves which include capacity sales to third parties because: there are no executed contracts between Licensee and the third parties; even if there were executed contracts, the needs of third parties may be totally contingent on Midland's availability;

other systems are able to supply the capacity instead; and Licensee has not analyzed the load and generating capability forecasts of the third parties to see if they need the equivalent power they desire to purchase, Intervenors' Findings, Paragraph 70 at pp. 90-91. Intervenors ignore the practical considerations regarding the source of power for the third parties, and the effects on Licensee of their choices of how to obtain the power. First, Intervenors' assertion that Licensee projects the same purchases regardless of the availability of the Midland Plant (Intervenors' Findings, Paragraph 70 at p. 90) is simply incorrect. Intervenors' shallow analysis of this area is apparent from the fact that their witness was unaware of the identity of different parties to the sales.[167/] Intervenors' witness himself eventually discovered that Licenseeincluded no energy or capacity sale to the cooperatives in the event of Midland unavailability.[168/] Second, Licensee has described the status of the negotiations with the third parties on which its planning judgment as to specific quantities of capacity sale and buy-back in future years is based; this planning judgement is adequately supported.[169/] Third, there are likely to be demands placed on Licensee's system even if the third parties do not purchase needed capacity from the Midland Plant. As explained infra, municipals may very well have to purchase energy from Licensee's system in any event. However

even if third parties' demands are met by their own installation of capacity or by purchasing energy from a system interconnected with Licensee to be transmitted via Licensee's system,[170] Licensee's inclusion in a large interconnected system means that the manner in which the third parties meet energy needs will affect the availability of capacity reserves in the interconnected system as a whole and thus the reliability of Licensee's system. Third party purchases from the total system, by definition, reduce its total capacity reserves, as each of the purchasing systems is completely internal to Licensee's system.[171] Because Licensee primarily relies on capacity available from other systems for the total amount of reserves necessary for reliability purposes,[172] any action affecting the availability of capacity from other systems impacts the total amount of reserve available to serve Licensee's customers, and would adversely impact Licensee's system reliability in the same manner that it will impact the reliability of interconnected systems.[173] Fourth, Licensee has assumed that the cooperatives took their entire portion of the capacity of Detroit Edison's Fermi Unit in the event of the unavailability of Midland.[174] If Midland is available the cooperatives have chosen to purchase portions of both Midland and Fermi.[175] However, there is nothing to suggest that the municipals

have the option of purchasing a portion of Fermi even if it is available,[176] as they have not chosen to negotiate with Detroit Edison regarding such a purchase.[177] Intervenors' witness stated that he was unaware of whether the municipals would require Licensee to provide the power regardless of Midland unavailability.[178] As for purchases from Ontario Hydro, the record does not support a finding that Ontario Hydro could meet the demands of the third parties, Intervenors' Findings, Paragraph 70. The record demonstrates that Ontario Hydro may have excess capacity in the years 1978 through 1980, but not in 1981 through 1984, the relevant period and the years upon which Intervenors rely.[179] Also, the municipals and the cooperatives have no practical method of entering into transactions for capacity and energy outside of Michigan.[180] Fifth, Licensee has in fact reviewed the load forecasts of the cooperatives and they appear accurate.[181] Lastly, it is true that forecasted sales to another utility such as the municipals or cooperatives, either of capacity or energy, are never included, as a matter of form, as part of Licensee's "Load" in reserve tabulations,[182] Intervenors' Findings, Paragraph 70 at p. 90. Rather, Licensee's analysis shows the requirements in the separate category of "Purchase."[183] Intervenors misinterpret the import of this description of the procedure for tabulating reserves as an indication that sales to third parties should not be taken into account at

all, and as somehow related to the existence of a contract.[184]

46. The third area which Intervenors attack in assessing Licensee's reserve capacity is the handling of Licensee's Palisades Plant, Intervenors' Findings, Paragraph 70. Intervenors mistakenly assume that since the derating and outage of Palisades are not completely certain, as Licensee has acknowledged,[185] Licensee need not plan for their occurrence. Licensee's witness in fact did not state that sleeving "may well solve" Palisades problems, but rather that he did not feel secure that sleeving would be a satisfactory fix.[186] Prudent planning requires viewing the system with progressive derates of the Palisades Unit and an outage for repairs or equipment replacement; planning enables Licensee to have an outage at the best possible time in terms of reserves and economics.[187] The extensive technical expertise which formed the bases for the planning decision on Palisades has been shown.[188] In contrast, Intervenors' conclusions were presented by a witness who was clearly not qualified to testify on the subject.[189] He made no investigation of whether tube plugging affects flow through the primary side of the Palisades reactor,[190] the basis for Palisades' projected derating and outage,[191] nor could he state what type of calculation would be required to determine a derating from a secondary side limitation by plugging the steam generator tubes of a nuclear reactor.[192] Intervenors' analyses of Licensee's

capacity reserves if Palisades continues in service at its present capacity beyond 1980 are therefore useless, Intervenors' Exhibit 31I, 31J, 31K, 31L, 31M. Intervenors also conclude that capacity from Ontario Hydro could substitute for Palisades capacity in the years 1978-1980 (Intervenors' Findings, Paragraph 70 at p. 92), despite the fact that Palisades could not be taken out of service for replacement of steam generators, the preferred repair alternative, until 1981 at the earliest because of equipment procurement lead times.[193/] Also, Licensee's witness actually stated that he was uncertain whether capacity from Ontario Hydro could fully cover a Palisades outage.[194/]

47. The conclusion drawn by Intervenors from the application for an uprating of Palisades is not warranted by the record. Intervenors' testimony on this subject, which is in the nature of a legal conclusion, was prepared without a careful review of the Palisades Environmental Report, the draft addendum to the Palisades Final Environmental Statement, or the testimony in this proceeding to determine whether there had been an analysis of Palisades' ability to operate at the requested higher capacity.[195/] In fact, such an analysis was not expected to be completed until sometime in July.[196/] Intervenors further citation to a Staff Safety Evaluation regarding deferral of inspection at Palisades is inappropriate since it is not of record. The problems with

such citations are apparent from the omission in Intervenors' Findings of the context of the quotations. It is apparent from that document that inspection is made and tubes are plugged in advance to provide an "operating allowance" for safe operation of the Plant. Intervenors' Exhibit 82, p. 1. The Evaluation does not say that tube degradation is not continuing, nor that additional plugging will not be necessary, but "it is expected that the wastage rates have [likewise] decreased." Id. at 2 (emphasis supplied). The Staff's Evaluation "concluded that these [present] operating allowances would conservatively account for any tube degradation until the next inspection and provided reasonable assurance that tube integrity would be maintained" for another five months. Id. at 1.

48. Based on the foregoing discussion, it is clear that Intervenors' assertions that Licensee will have in excess of 20% installed reserves if Midland is delayed are unsupported, Intervenors' Findings, Paragraph 70 at p. 93. The attempt to then cast doubt on Licensee's projected sales of Campbell Unit 3 by claiming a different treatment in

another proceeding is also unwarranted. Id.* Intervenors' witness actually was forced to admit that the treatment of this proposed sale, a sale to the cooperatives, is completely consistent with the treatment of sales to cooperatives in this proceeding.[197/]

49. Intervenors' second major dispute with Licensee concerns Licensee's conclusion that a 20% installed reserve margin is necessary to meet Licensee's LOLP criterion, Intervenors' Findings, Paragraph 71. Three major arguments are included in this section; they pertain to the use of

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*Intervenors assert an unexplained difference between the two filings in the use of different capacity factors (Intervenors' Findings, Paragraph 70 at note, p. 93); these differences have been adequately accounted for. See Calcaterra Affidavit. Intervenors' vague assertion that there are other "unexplainable differences" between the two filings is completely unsupported by the record. See Calcaterra Affidavit. In fact, the record is now clear that Intervenors' charges were based on their own misunderstanding and superficial review of Licensee's analyses. (See e.g., Tr. 5038-53, 5312-51, 5764-70, 5968-6020). Their willingness to cry "liars" (Tr. 5039) on the basis of their own inadequacies is, to say the least, regretable.

"historical" versus "projected" unit availabilities, the availability of purchase power, and the use of an analysis of Licensee's system or of a larger area such as the Michigan Electric Coordinated System (MECS) or the East Central Area Reliability Coordination Agreement (ECAR). Intervenors' assumptions cannot be supported, and therefore their selections of a required reserve margin are inaccurate. Intervenors' Exhibit 35R. Intervenors show a misunderstanding of this subject area as well. Intervenors' witness was not familiar with Licensee's system or its interconnections.[198/] He also confused "forced outage rate" with "availability", confused "availability" with "capacity factor" and was unfamiliar with the difference between peak unit capacity and normal maximum loading.[199/]

50. First, rather than relying on the record of this proceeding, the backup papers provided, or explanations by Licensee's experts, Intervenors choose to interpret Licensee's 1976 Annual Report's description of an increased maintenance budget as enabling sole reliance on a set of unit availability figures provided to them which show substantially higher "projected" availability goals than "historical" availabilities, Intervenors' Findings, Paragraph 71.[200/] Intervenors ignore the analysis of reserve requirements containing the "historical" availabilities,[201/] and thereby project reserve requirements much lower than does Licensee.[202/] Intervenors' analysis is

inconsistent with prudent planning.[203] Intervenors' witness did not examine the amounts of proposed versus historic unit maintenance on Licensee's system,[204] but only assumed that availabilities labeled "projected" would be met in the future. This was based largely on the witness' "judgment"[205] and the description in the Annual Report (which does not project availability figures),[206] despite their great variation from "historical" availabilities. Intervenors' witness was informed that the results of computer analyses using both "historical" and "projected" data were used by Licensee to determine future reserve requirements, and was also told that the reason both were used was to reflect the fact that "projected" availabilities represent goals which may or may not be attained.[207] The witness eventually admitted that both sets of data were used by Licensee.[208] This fact was confirmed by Licensee.[209] It is unlikely that the "projected" availabilities will be attained by 1982-83.[210] Average unit availability was approximately 70% in 1976, down 20% from the 1967 level.[211] In contrast, the figure representing average "projected" availability is approximately 80% for 1982-83.[212] Intervenors claim that substantially improved availabilities will result from any increased maintenance based on the correlation between the two variables shown by an availability decline from 1973-1976 when maintenance had been diminished, Intervenors'

Findings, Paragraph 71 at 95. However, Licensee's maintenance cutback cannot be seen as the only cause of those declining availabilities. Intervenors ignore the precipitous drop in availabilities from approximately 89% in 1967 to 77% in 1971, for which they assert no such cause.[213/] Moreover, even if an increased maintenance program could completely reverse the decline in availabilities seen since 1973, as Intervenors assert may occur, average unit availability would only reach approximately 77-78%.[214/] Thus, by Intervenors' own analysis, i.e. if Licensee regains the amount of reliability lost during three years of budget cutbacks,[215/] unit availabilities would not be expected to meet the 80% figure upon which they rely by 1982-1983.[216/] Further, Licensee cannot rely on the uncertain "projected" availability figures, because the effect of relying on these high availabilities and not attaining them would reduce system reliability.[217/] First, lower than projected reserves would result, which by definition would reduce reliability[218/] and would contradict prior planning for reserve supply.[219/] Second, reduced reserves would prohibit performance of some scheduled unit maintenance; reduced maintenance, of course, in turn exacerbates reliability problems.[220/] In addition to concerns over improvements in existing unit availabilities, there is an added question of whether the large units yet to be added to the system will attain the "projected" availabilities. Licensee has little historical experience with such units. For example,

3 of Licensee's new large units have a "projected" availability of 80%, and data from a large utility group shows an equivalent availability for such units of approximately 70%.[221] Thus, prudent planning requires using historically based availability expectations as well as considering projected goals.[222] Intervenors assertion that the use of "projected" figures achieves consistency with the replacement power cost analysis, which would "significantly decrease" if historical figures were used, is totally unsupported. In fact, replacement power costs would increase if "historical" availabilities had been used in the analysis.[223]

51. Intervenors' conclusion that Licensee's installed reserve requirements are 16% in 1981 and 1982 and 13% in 1984 (Intervenors' Findings, Paragraph 71), is based on an analysis which begins by assuming unwarranted generating unit availabilities and which proceeds to assess Licensee's required installed reserves by assuming the availability of an amount of purchase power which is also unsupported. Intervenors again demonstrate their lack of understanding of the workings of an interconnected system and of reliability assessment procedures.[224] First, use of the historical availabilities, even with the further miscalculations made by Intervenors' witness would show reserve requirements of 23% for Licensee's system.[225] For example using only "projected" data in the analysis gives a twelve times better system reliability in 1984 than would be seen using only "historical"

data.[226] Second, Intervenors' analysis assumes the availability of emergency purchase power in the amount of 30% to 40% of total capacity (Intervenors' Findings, Paragraph 71; Intervenors' Exhibit 35R), allegedly based on Licensee's testimony.[227] Licensee has not asserted that it is able to purchase power in the amount of 30-40% of peak load for emergency purposes, but rather that total reserves equivalent to 50-60% of peak load are required on Licensee's system to maintain its LOLP, and that Licensee determines it needs installed reserves of 20% considering the backup power normally available.[228] Intervenors' witness admitted that the 30-40% difference is associated with necessary added capacity rather than purchased power.[229] Reserves are determined by the megawatt margin on load, signifying variations in the amount of load or of firm load carrying capability.[230] Availability of reserve capacity cannot be equated with firm load-carrying capability from interconnected systems.[231] The difference is an obvious one: capacity numbers have outage rates associated with them so that an equivalent amount of purchased power will not always be available.[232] Thus, Intervenors' analysis does not take into consideration the probability of outages on interconnected systems, delays in their installation of generating capacities, or any other reason for the unavailability of purchase power when Licensee's system would need it.[233] It is clear then, as

Intervenors' witness admitted, that the amount of purchase power assumed available for the purposes of Intervenors' analysis is not entirely available to Licensee.[234] It should also be noted that even if Intervenors had corrected their assumptions regarding assistance available from interconnected systems to reflect firm load carrying capability rather than capacity, a different amount of power would be available to its system if it installed a 16% reserve instead of a 20% reserve, because if Licensee only had a 16% installed reserve in 1981, the distribution needed capacity purchases shown in Intervenors' analysis would shift.[235]

52. Aside from being an inaccurate portrayal of Licensee's data, Intervenors' assumption that 1950 Mw of firm capacity will be available when needed, based on other current data, is unwarranted.[236] In order to achieve its LOLP in 1981, Licensee has determined that it will need to have available 1600 Mw of firm capacity from interconnected systems.[237] However, this amount of firm capacity will not be available in 1981; even with current ECAR projections of system-wide installed reserve capacity of 23.4%, ECAR will be able to supply less than 1400 Mw of firm capacity support.[238] In this circumstance, even with an installed reserve of 22.7%, Licensee's system shows an LOLP of 2.3 days in 10 years.[239] Intervenors also failed to perceive that summer deratings of units are not modeled in Licensee's LOLP computer analyses, which would increase the required reserves in Intervenors'

analysis by .9%, Intervenors' Findings, Paragraph 71.[240]

53. The last ground upon which Intervenors challenge Licensee's need for 20% installed reserves is Licensee's use of its system alone as the basis for reserve calculations, rather than looking to the combined Licensee-Detroit Edison System (MECS) or the entire ECAR group of utilities, Intervenors' Findings, Paragraph 72. Intervenors'adoption of a recital of Licensee's reserves by an NRC Staff witness, which is higher than Licensee's projections, does not take account of a Palisades outage or sales to cooperatives.[241] Licensee analyzes its own system as a separate entity for planning purposes,[242] a practice which even the NRC Staff, who performed an MECS-wide reserve analysis, admits that Licensee must initially follow as a matter of long-term planning.[243] Licensee in fact plans separately from Detroit Edison;[244] it is necessary for Licensee to do so both as a matter of financial responsibility to its customers,[245] and because the burden of providing capacity in a given control area such as MECS must be borne equitably.[246] The NRC Staff has also acknowledged that reliability computations (comparing LOLP with reserve margins) evaluating only Licensee's service area are meaningful to determine Licensee's contribution to the overall reliability of the relevant control area.[247] It is appropriate to also look at the situations presented in both the MECS and ECAR.[248]

54. Licensee has reviewed the higher projected reserves for Detroit Edison and for ECAR mentioned by Intervenors and found that the impact of these changes upon Licensee's previous conclusions is minimal.[249] The Detroit Edison reserves are still not up to their current target level of 22%.[250] The projected ECAR reserves, if realized, do increase the probability of Licensee being able to purchase necessary capacity and energy. However, Licensee does not believe that these changes would justify a reduction in its nominal target reserve level.[251] The figures upon which Licensee's testimony is based would have justified a raising of Licensee's nominal target reserve levels to higher than 20%, but the uncertainties existing in the projections of capacity and demand did not justify such a change.[252] Because of present uncertainties, Licensee has concluded that it should not now lower its nominal target reserve level below 20%.[253] Uncertainties within ECAR, such as the possibilities of delays in construction, fuel availability problems, long-term forced outages, financial problems requiring delay or cancellation of construction, or other serious circumstances could result in ECAR reserve levels being less than adequate in any future year.[254] For example, ECAR member American Electric Power (AEP) has expressed some concern in the April 1977 ECAR Report about its ability to finance and obtain permits for three 1300 Mw coal-fired generating units.[255]

Approximately 50% of ECAR's newly projected increased reserve margin in 1982 and 1983 is based on AEP's ability to construct these units.[256/] Data is also continually changing. For example, Licensee was recently advised that Detroit Edison has lowered its generating capability ratings by a factor of 233 Mw.[257/] Thus, the need for the Midland Plant to begin operation in 1981 and 1982 is not diminished by the changes cited by Intervenors. A delay of Midland under the current planning concept would reduce the reserve level to under 20% in the early 1980's, and under such conditions there is no assurance that Licensee would be able to buy the required capacity and energy necessary to maintain reliable low-cost service to its customers.[258/]

Thus, Intervenors' analysis of Licensee's reserve requirements is totally inadequate for the following reasons: Intervenors use only "projected" unit availability goals rather than weighing in historically based availabilities; Intervenors assume the availability of an amount of purchase power which is not supported; Intervenors ignore summer reductions in Licensee's generating capacity; and Intervenors mistakenly believe that current data regarding ECAR and Detroit Edison reserves changes Licensee's reserve requirements. Licensee cannot maintain its LOLP goal of 1 day in 10 years with a 10-16% reserve level; Licensee's system cannot approach this LOLP nor operate its system dependably and economically

with less than 20% installed reserve in the early 1980's.[259/] Increased dependence on interconnected systems would be imprudent for Licensee and not in the best interest of its customers.[260/] Thus, even with the purchase power availability based on the current uncertain ECAR reserve figures the Midland Units are required for system reliability when they are to come on line.[261/]

VII. Cost of Delay

56. Licensee's estimated costs of delay if construction of the Midland Plant is suspended are set forth in Paragraphs 78 through 95 of Licensee's Findings. Intervenors challenge the accuracy of these costs on a variety of grounds, none of which bears up under scrutiny, Intervenors' Findings, Paragraphs 75-78, 80.

57. Intervenors' first attack concerns the fact that Licensee's delay costs fail to take into account that as payments are delayed, they are made in inflated, and therefore cheaper dollars, Intervenors' Findings, Paragraph 76. However, escalation in capital costs of a plant, which includes an inflation factor,is clearly felt by utilities' customers. The rates which consumers pay are based on operating expenses plus a stated return applied to a nominal dollar rate base. The higher the amount of nominal dollars in a rate base, the greater the number of dollars which consumers will have to pay in their rates, regardless of the purchasing power of the dollars in rate base or of the dollars with which rates are paid. If consumers are paying on the basis of a rate of return of 10%, they will pay 10 cents for every dollar in rate base, whether it be a 1920 dollar, a 1978 dollar or a 1982 dollar. This is true regardless of whether the 1985 dollar with which rates in 1985 will be paid has more or less purchasing power than a 1978 or 1982 dollar. Consequently, it is the amount of nominal dollars invested in a plant which will have a significant economic effect upon

consumers.

58. Finally, the cost of delay must include escalation, and therefore inflation, for comparative purposes. Capital costs of a plant are all in nominal dollars of differing purchasing power--dollars invested over a period of 10-15 years. The objective of evaluating the costs of delay must be to arrive at the number of additional nominal dollars that will have to be invested in order to bring the plant to completion as a result of the delay, in order to judge whether this is a significant additional amount when compared to the amount of nominal dollars which would have to be expended to completion if there were no delay. The logic of Intervenors' position, were it to be followed, would require, for example, that delay costs stripped of the escalation factor be compared to an amount based on the original cost estimated for the Midland Plant, rather than the $1.67 billion current cost estimate (which includes escalation for the long periods of delay experienced by that plant) in order to judge the significance of the delay costs. It would seem far more logical to weigh escalated costs against escalated costs in judging the significance of the effects of delay. Moreover, eliminating the inflation factor in calculating the costs of delay to reflect Intervenors' position that "as payments are delayed, they are made in inflated dollars" (Intervenors' Findings, Paragraph 76) would make very little, if any, difference in the total amount of delay costs. To illustrate, a five-month suspension

would result in a $142,000,000 increase in the total capital cost of the plant.[262] This is the only delay cost to which the inflated dollars concept could be applicable, for the payments for increased replacement power costs would not be moved back as a result of the suspension. The capital cost increase of $142.1 million (without rounding)[263] includes a component for escalation, computed at 7%, which equals $35.3 million.[264] The portion of that figure attributable to inflation, (calculated at 5.5%) is $27.73 million.[265] This is hardly a significant figure when viewed in light of the total delay costs for the five-month case of $335,935,000. Furthermore, the $27.73 million figure is off-set by the increased costs for income taxes, operation and maintenance costs, and nuclear fuel cost after the first core, which Licensee has not included in the costs of delay.[266]

59. The second issue raised by Intervenors is the alleged "savings to [the] ratepayers" which would result from a suspension of construction, Intervenors' Findings, Paragraph 76. This rather novel theory, advanced by Intervenors' witness Dr. Timm, states that, since the ratepayers would not have to pay the fixed charges on the Midland Plant during the delay period, a true assessment of the delay costs for Midland would necessitate a subtraction of the fixed cost charges which would not be paid at that point in time by the ratepayers from the capital cost of the Plant. However, these numbers are not comparable since fixed cost charges include such items as taxes, depreciation, rate of return, etc., whereas the capital costs of the plant do not

include any such items.[267] Dr. Timm then argued that reflection of that "savings" due to delay in payment by the ratepayers of the fixed charges would result in a present worth savings to the ratepayers of $114 million. It was demonstrated on cross-examination that in computing this "savings", the witness had really required that the ratepayers contribute $220 million in capital to Licensee in order to save $114 million.[268] This result was confirmed in the testimony of NRC Staff witness Arnold Meltz.[269] Another indication of Dr. Timm's weakness in economic theory is his statement at Transcript 5602 that his result with regard to the present worth $114 million "savings" to ratepayers could be arrived at by two different methods. Under cross-examination by counsel for Licensee it was established that in fact the other method which the witness stated would produce the same result as his first approach actually produced, a savings of zero to the ratepayers.[270]

60. A third supposed "savings" due to suspension, as calculated by Intervenors, is attributable to the "other end" of the 34-year life of the Midland Plant, during which replacement or differential power costs would not be incurred, Intervenors' Findings, Paragraph 76. Intervenors contend that such a "savings" is due to the fact that in the year 2015, the point of expiration of the useful life of the Midland Units, the construction of a replacement plant could be delayed for the period of the initial delay in the Midland Units, because Midland would continue in service for that

period of time. Dr. Timm argued that this "savings" should be deducted from or offset against replacement power costs computed by Licensee. When cross-examined as to whether such a "savings" in the year 2015 should not have been present- worthed back to 1981 dollars, the witness sought refuge in an assumption which he claimed he had made that the inflation rate through the year 2015 would equal the escalation rate in construction of a nuclear power plant through the year 2015, which in turn would equal the discount rate for the period 1981 through 2015.[271] This, according to the witness, made present-worthing unnecessary since the assumption meant that the value of the "savings" in 1981 dollars would equal that of the savings in 2015 dollars.[272] It is interesting to note that the witness made this assumption despite the fact that in all other computations he utilized an escalation rate of 7% and a discount rate of 11.75%.[273] Under cross-examination, the witness denied that his assumption necessarily implied that an investor would seek a zero percent rate of return[274] despite the fact that he admitted that the discount rate is basically equivalent to the cost of money, and that the cost of money is equal to inflation plus the real cost of money which generally is considered by economists to equal 3%.[275] He further admitted that the opportunity cost of money would generally be higher than the 3% real interest rate in order to compensate for risk to the investor.[276] Realizing that he had been trapped in inconsistent assumptions, the witness then changed his testimony[277]

to state that his assumption had been that the escalation rate had been equal to inflation plus the real interest rate and that escalation had been equal to the discount rate, thus reversing himself with regard to his prior statement that escalation had been assumed equal to inflation. But that this assumption was to say the least disingenuous was amply brought out at Transcript 5878-81, where Licensee's counsel asked the witness whether his assumptions did not necessarily result in the highest possible "saving" in his computations. The witness responded that they did not because in fact the discount rate could be equal to less than the escalation rate, whereupon Licensee's counsel pointed out, and the witness admitted, that under such an assumption Licensee would be better off economically building a plant today for service in 2015 and mothballing the plant until that point in time.[278/] The witness also admitted that his assumptions in this analysis were without basis in the literature and that he knew of no economist who postulated such a possibility (equivalence of escalation rate to discount rate) for the future.[279/] We find it difficult to understand how anyone with even a rudimentary knowledge of economics and economic theory could augustly postulate such an assumption.

61. The last, and perhaps the greatest, area of controversy between Licensee and Intervenors concerning the costs of delay is the calculation of replacement and/or differential power costs, Intervenors' Findings, Paragraph 77.

The numerous faults which Intervenors find with Licensee's calculations, none of which are meritorious, will be discussed seriatim.

62. First, Intervenors criticize the fact that Licensee has not postulated any reduction in Dow demand for purposes of calculating the replacement power costs. It would be erroneous to reduce Dow's demand, as Intervenors' witness Dr. Timm has done,[280/] for the reason that Dow's demand for power exists, and thereford it must be met, whether by Licensee or by Dow itself. Not to include the costs of this generation by Dow would be to assume that Dow receives free power, a manifest absurdity. Incidentally, Dow has stated that it utilized Licensee's costs for producing power in calculating the costs of Dow's alternatives, thus it is entirely proper for Licensee to rely upon these figures.[281/] Similarly, Intervenors criticize Licensee for including sales to the municipals and cooperatives in the replacement power calculations, Intervenors' Findings, Paragraph 77. It is appropriate and necessary for Licensee to do this as the full generation from the Midland Plant must be priced out in computing these costs. It is also contended that Licensee's derating of the Palisades Plant is unwarranted; this has been fully justified, supra. Licensee's growth forecasts and reserve requirements have also been documented, supra.

63. Another criticism of the replacement power costs is Intervenors' contention that Licensee has premised those costs on supplying demand exclusively from its own system

rather than taking into account power available from other sources and giving appropriate credit for the reduced costs to other systems, such as Detroit Edison. This represents a clear misunderstanding of replacement power costs on the part of Intervenors, for these costs are based on computer modeling which simulates the economic dispatch of Licensee's generating units, Licensee's normal power exchanges with Detroit Edison, and estimates Licensee's additional purchase power requirements and associated costs from other utilities.[282/] Intervenors' witness also argued that replacement power costs could be reduced by Licensee by the purchase of additional economy energy from Detroit Edison. Intervenors' Findings, Paragraph 77. However, on cross-examination of Dr. Timm it was brought out that his postulated additional economy energy purchases from Detroit Edison would be at a cost of 55 mills per kilowatt hour, substantially above the price of replacement power purchases projected by Licensee. Once again the witness' conclusions were based on an inadequate assessment of the data.[283/] In addition, Intervenors' suggestion that other systems should be credited for the sales of power to Licensee ignores the obvious fact that Licensee would similarly have to be credited for its sales of power to other utilities.

64. Intervenors' next assertion is that Licensee's computer simulations include "forced purchases" which result in significant and unjustified increases in the cost of replacement power. In his original testimony Dr. Timm

identified the source of these "forced purchases" as purchase 10 power and calculated that these purchases increased the replacement power costs by $24.8 million, $29.5 million and $58.4 million for his Cases II, III and IV, respectively.[284/] Following the filing of the rebuttal testimony of David A. Lapinski, who designed the production costing program,[285/] and the cross-examination of Dr. Timm, it was established that Dr. Timm's calculations were based on an extremely superficial review of the data, which led to his failure to understand it and to consequently erroneous assumptions, and that they were replete with errors, all as outlined below:

1. The input data for the computer runs he supposedly analyzed were not even reviewed by Dr. Timm;[286/]

2. He incorrectly used "maximum net demonstrated capability" for generating units rather than the "normal maximum rating" of the generating units;[287/]

3. Moreover, as shown at Tr. 5790-5802, the witness incorrectly applied availability numbers derived for generating units operating at normal maximum loading to peak capacity of the units, without ever attempting to determine whether those availability factors were actually applicable to peak capacity. In addition, the witness admitted that he did not even know what the normal maximum loading of the units was.

4. He did not take into account daily and seasonal variations in either Licensee's load or the generating capability of Licensee's units;[288/] and

5. He ignored the difference in price of purchase power during peak and off-peak hours.[289]

During his cross-examination, Dr. Timm also testified with regard to his criticism that purchase 10 power inflated the cost of replacement power, as follows: "[N]ow, those are the purchases which are scheduled in at a 90% capacity factor by your memorandum (Intervenors' Exhibit 37) and also they are in your computer input";[290] and further, "[t]he purchase 10 power is being brought in at a cost of 35.4 mills per kilowatt hour. It's brought in at a 90% capacity factor. That means roughly 22 hours per day, and it's forcing your Campbell Unit 3 to back off, even though it's a cheaper unit."[291] At that point in the record, the question and answer were read back to the witness and he was asked to consider his answer carefully and to be certain that he wanted his testimony to be as he had stated. The witness then reaffirmed his testimony at Transcript 5831. However, at Transcript 5863, the witness admitted that he knew that in fact the purchase 10 power had been factored into the computer runs at a 70% capacity factor rather than a 90% capacity factor. When this answer is compared to the answers at Transcript 5829-30, it is difficult to avoid the conclusion that the witness was not being straight-forward. This type of approach was continued in Intervenors' Findings in which they cite that portion of their Exhibit 37 which refers to the 90% capacity factor and make no attempt to acknowledge that it is incorrect.

65. The result of the cross-examination of Dr. Timm was his admission that he did not know whether purchase 10 would cause the replacement power costs to increase and that, to make such a determination the program would have to be rerun without purchase 10 included.[292/] Mr. Lapinski's rebuttal affidavit established at page 5 that Licensee had in fact gone through an iterative process to determine how purchase 10 should be factored into the computer program and that the elimination of purchase 10, instead of decreasing the cost of replacement power as claimed by Dr. Timm, actually increased the costs by 19%, 16% and nearly 60% for each of Dr. Timm's respective cases.

66. Not content to gracefully withdraw, Intervenors now rely in their Findings on Dr. Timm's "corrected" decrease in replacement power costs of $13 million,[293/] a discussion in Dr. Timm's rebuttal affidavit at Paragraphs 18-21 that a portion of purchase 10 forces baseload units to back off during the hours of purchase, and that Licensee does not now make such purchases, citing Transcript 1848. As to Dr. Timm's corrected figure of $13 million, he stated that "a more precise answer could be obtained from rerunning the program".[294/] In fact, as noted above, the program was rerun prior to entering purchase 10 as an input and the precise number is an increase in replacement power costs, not a decrease. As to Dr. Timm's argument in his rebuttal affidavit, he ignores completely the impact of the reduction in pumped storage operation when purchase 10 is utilized.

More importantly, he also ignores the fact that Mr. Lapinski has already calculated the impact directly attributable to backing off baseload units during the hours of purchase to be less than 0.5%.[295/] Finally, as to their last argument, Intervenors' cite to Transcript 1848 is inappropriate. The question on that page goes to whether Licensee automatically buys energy everytime the reserve level falls below 20%. The answer to that question is no, and that answer has no relevance at all to the question of whether purchase 10 was correctly modeled in the cost production program. Thus, it is clear that Intervenors' arguments regarding purchase 10 are incorrect and unfounded and should be rejected.

67. It should further be noted with regard to Dr. Timm's criticism of the derivation of replacement power costs by Licensee that cross-examination pointed out that the witness is unfamiliar with the characteristics of generating capability of Licensee's units.[296/] Dr. Timm also makes the assumption, without any basis in the record, that replacement power costs are non-linear. Licensee does not believe that departure from linearity should be assumed absent a proper foundation.

68. Intervenors further criticize the replacement power costs because of allegedly high coal cost estimates. Once again, the charge is without foundation. Testimony has shown that Licensee's base coal prices and escalation rates are reasonable (and incidentally that Dow's coal price escalation rates are unreasonably low).[297/] Intervenors' reference to the studies reviewed by NRC Staff witness Dr.

Sidney Feld is misleading, for what Dr. Feld actually testified to was that there were but two studies out of the many he reviewed which predicted real declines in the price of coal.[298/] Finally, Intervenors comment at Paragraph 78 of their Findings that the Administration's energy program will tend further to lower the cost of coal by encouraging additional use and production. Therefore, Intervenors argue, alternative power would be cheaper than power from the Midland Plant during the delay period. This statement flies in the face of economic reality, for as the demand for coal rises, so will the price.

69. In addition to questioning Licensee's coal costs, Intervenors attack Licensee's nuclear fuel costs. However, there are no inconsistencies between Licensee's testimony in this proceeding and that before the Michigan Public Service Commission (cited in Timm Testimony at 81-82). Licensee's fuel cost computer runs were done after the time that Licensee had revised the uranium salvage value to zero, thus the figures here comport with the philosophy expressed in the rate case.[299/] Furthermore, the testimony of NRC Staff witness Jack Roberts makes clear that Licensee's nuclear fuel costs are high (i.e. conservative) but not unreasonable. As the high case nuclear fuel cost values in the NRC Staff testimony are not very different in the recycle or no recycle cases, and as Licensee's fuel costs are higher than the NRC Staff's high case assuming recyle, the possibility that

there may not be plutonium reprocessing and recycling would not adversely impact the cost-benefit balance for the Midland Plant.[300/]

70. Finally, Intervenors take issue with the capacity factor of 70% which Licensee postulates for the Midland Plant in calculating replacement power costs. Dr. Timm asserts that the use of less than a 70% capacity factor for Midland during its first year of operation will lower these costs.[301/] In fact, however, the use of a lower capacity factor for the plant during its first year of operation would only shift the replacement power costs to later years as the units mature.[302/]

71. The NRC Staff has also criticized one element of Licensee's delay costs, allowance for funds used during construction (AFUDC), on the ground that the incremental amount resulting from a suspension of construction will not necessarily involve an out-of-pocket expense, since until the plant goes into opertion, "AFUDC is little more than an accounting procedure," NRC Staff Findings, Paragraph 137. This is simply not true, as the testimony of NRC Staff witness Arnold Meltz demonstrates. In explaining the concept of AFUDC, Mr. Meltz testified that, "This means that Consumers Power Company and most other electric utilities with large construction programs expend sizeable amounts of money on which they receive no cash return until the 'used and useful' test is satisfied."[303/] In its Findings, the NRC Staff confuses the income and expense sides of the ledger. AFUDC income is an accounting entry allowing a

utility to capitalize, and later earn a return on, its costs of raising the funds necessary to finance construction. Capital raised to pay for construction requires cash dollars of return to meet interest and dividend requirements during the construction period -- clearly an "out-of-pocket" expense. The AFUDC income item is, however, not cash, but merely an accounting procedure which allows the utility to include the cash dollars actually expended for interest and dividends during construction in rate base and recover them from the ratepayers at a later point in time. In this way the utility is compensated for the lack of cash dollar income to offset cash dollar expenses during the construction period. While it is true that the ratepayer does not begin to pay for this cash dollar expenditure until construction is completed and the plant is in rate base, the utility experiences these cash costs now, while the plant is under construction. An extension of the construction period for 9 or 15 months means that, since cash income will be unavailable to cover these expenses for that additional period of time, these cash expenditures will have to be covered by raising additional outside capital during the construction period. Of course, this means that the utility will then have to pay additional interest and dividends on the needed additional financing. See FPC Order No. 555 (41 F.R. 51392), November 8, 1976. It is the cost of these additional cash interest and dividend payments on the additional financing required in order to pay interest and dividends on the funds used to

pay for construction for a longer construction period which is reflected in the AFUDC cost included in Licensee's delay costs. The present worth of that stream of interest and dividends to be paid into the future, under standard discounted cash flow theory, should approximate the amount of the additionil capital raised, which in turn should approximate the additional AFUDC computed on the plant investment. To argue, therefore, that AFUDC does not reflect cash expenditures by Licensee is simply incorrect.

VIII. Costs of Alternatives

72. In Paragraphs 79 and 80 of Intervenors' Findings, the alternative to the Midland Plant postulated by Licensee is criticized on several grounds, and Intervenors' alternative is touted as the proper one. Licensee will address both of these topics, demonstrating that Intervenors' proposed alternative is based on false assumptions and when correctly analyzed has a decided economic disadvantage when compared to the Midland Plant.

73. Intervenors' analysis of the cost of alternatives aptly demonstrates the shallowness of the review which they performed and presented to this Board. Their analysis is replete with errors which evidence a lack of care, a lack of candor or both. For example, while Intervenors' witness, Dr. Timm, acknowledged the responsibility of a witness to verify the assumptions used in his calculations,[304] the record demonstrates that Dr. Timm did not review either the testimony of Licensee witness Keeley or his back-up documents in detail;[305] nor did he review the current rate case filing in detail.[306] The witnesses' evasiveness and lack of candor is shown clearly at Transcript 5512-20 where he attempts to avoid admitting the fact that he double present-worthed the capital cost for his coal alternative, an admission he was finally compelled to make at Transcript 5520, 5525-26 and 5529. With this background in mind, a proper analysis of

Intervenors' alternative must begin with their original testimony.

74. Intervenors' original testimony on alternatives was summarized in their Exhibit 46 which purported to show that their proposed alternative, construction of a facility to produce steam and electricity for Dow and a separate facility to produce 800 Mw of electricity for license, had a cost advantage of $150 million over the Midland facility.[307] However, during cross-examination a number of errors in this analysis were pointed out.

75. The first category of errors which Intervenors, through their witness Dr. Timm, made concern the output and capacity factors assigned to the alternatives. Dr. Timm used the figure of 4,050,000 pounds per hour of steam to Dow in computing the electrical capacity from Unit 1 of Midland; this results in less electricity being generated than if he had used 2,800,000 pounds per hour of steam.[308] However, Dr. Timm then designed the unit of his alternative intended to service Dow for 2,800,000 pounds per hour of steam. This resulted in understating the amount of electricity output by Unit 1 and comparing non-equivalent energy sources, a fact which witness Timm admitted.[309] Dr. Timm then indicated that additional capital cost would have to be incurred in order to generate this additional electricity from Midland, and that he had not included these costs, thus offsetting his error.[310] His testimony is in error on this point too,

since Midland Unit 1 is already designed to enable it to generate the additional electricity and, consequently, no additional capital costs would be necessary.[311] The increased cost of Intervenors' alternative due to this capacity error, $86 million, plus the $97 million due to the double present-worthing, both admitted by Dr. Timm,[312] are enough, by themselves, to demonstrate that it is not economically advantageous when compared to Midland.

76. However, other errors in the analysis were pointed out. For example, Dr. Timm used different capacity factors for the coal alternative (80%) and the Midland Plant (70%).[313] This fails to take into account the fact that an 80% capacity factor is applicable only to plants using Eastern EPA quality low-sulfur coal, while 70% is the proper capacity factor for high-sulfur coal.[314] Western low-sulfur coal is more troublesome than Eastern low-sulfur coal; a lower capacity factor would also be appropriate for a plant using the former type of coal.

77. Dr. Timm's analysis also does not acknowledge that his coal plant with an 80% capacity factor would have less capacity available to meet peak loads than the nuclear plant with a 70% capacity factor. The difference in capacity available at peak loads is further increased due to the fact that a very large portion of the outages for nuclear plants are for rather lengthy periods, which are scheduled and thus do not occur at a peak load time, while a larger portion of coal plant outages are not scheduled and may occur during a peak.[315] Dr. Timm's analysis also did not reflect additional

benefits from the Midland Plant compared with the smaller coal plant, i.e., the fact that Licensee could sell the additional capacity from the nuclear plant and the fact that Midland would delay the addition of more capacity to Licensee's system in the amount of the difference in capacity between Midland and the coal plant.[316]/

78. The witness also utilized lower coal cost numbers which cross-examination established were simply not applicable to the type of plant he had priced out, namely an Eastern EPA quality low sulfur coal plant.[317]/

79. Other mistakes made by Dr. Timm in costing out his alternative include the fact that he did not allow for replacement power costs alleging that they would be offset by the alleged "savings" due to the delay in the plant.[318]/ These "savings" have been shown to be non-existent, see Paragraphs 59-60, supra. Furthermore, Dr. Timm utilized start from scratch costs, rather than incremental costs, as is appropriate.[319]/ However, and inconsistently, he did use an incremental cost analysis for the Dow unit in his alternative.[320]/

80. In projecting the on-line date for Licensee's coal unit in the Timm alternative, Intervenors' witness relies on an old rate case filing in calling for a 1983 in-service date and disregards the new rate case filing.[321]/ Licensee's Exhibit 21 shows an in-service date of 1984.[322]/ In addition, Dr. Timm has no idea whether environmental review requirements in Michigan have changed since the date of the old data he relied on. Such a change would increase the lead time re-

quired to place a new generating facility on-line.[323]/

81. The final area in which Dr. Timm's testimony exhibits a lack of consistency is in his estimate of, and dearth of knowledge about, the subject matter of coal costs, specifically as related to types of coal. Dr. Timm stated that the coal alternative he postulates to serve Licensee's demand would utilize low-sulfur coal.[324]/ However, Dr. Timm then went on to state that he had not checked to see whether Campbell 3, the Licensee unit upon which Timm's alternative is predicated, was designed to burn Eastern or Western low-sulfur coal.[325]/

82. Dr. Timm's coal costs are an average of the coal costs in various studies which he has reviewed.[326]/ The problem with this approach is that none of the studies specified that they were studies of Eastern low-sulfur coal prices, but, rather, they dealt with other varieties, such as high-sulfur Midwestern coal,[327]/ Western low-sulfur coal,[328]/ a combination of all coal types,[329]/ or an unknown type.[330]/ Furthermore, the figures from the various studies were not uniform in whether coal prices were escalated for inflation.[331]/ Neither did Dr. Timm account for the cost of transporting coal to Licensee's service area in calculating his coal costs.[332]/ Another factor which would influence Dr. Timm's coal prices is whether the studies assumed existing or new coal contracts. All of the studies which Timm reviewed

except the Wisconsin report included existing contracts with lower costs; new coal contracts have higher costs, and Licensee would have to enter into new contracts for coal to supply the Timm alternative.[333]/

83. In calculating the operation and maintenance costs of his alternative, Dr. Timm has costed a low-sulfur Eastern EPA quality coal plant (resulting in lower capital costs and operation and maintenance costs), which is inconsistent with his coal pricing.[334]/

84. It is also noteworthy that in computing future coal costs, Dr. Timm used only escalation for an inflation rate. However in the Oregon studies which he had worked on, and claimed the responsbility for directing and supervising, the escalation rate for coal was set at the inflation rate plus a real cost escalation rate of 2%, an escalation rate which would be even higher for Michigan than Oregon because of the longer transportation costs for Western low-sulfur coal and the fact that the transportation cost factor was projected to escalate at an even higher 3% in the Oregon studies.[335]/ Again, such an inconsistent approach by the witness tends to belie his objectivity and candor.

85. Thus, at the close of Dr. Timm's cross-examination on Thursday, May 12, 1977, his original Exhibit 46 was, for all practical purposes, useless. As a result, Intervenors produced on Friday morning, May 13, 1977 a revised Exhibit 46. This document, referred to as Intervenors' Exhibit

46(R) purported to correct the errors pointed out on cross-examination and to take into account Licensee's revised fuel costs for Midland.[336] According to Dr. Timm, this revision established that his alternative had a $288 million economic advantage over Midland.[337]

86. In response to his revised exhibit, Licensee witness, Richard F. Brzezinski submitted, by affidavit dated May 19, 1977, an analysis which demonstrated witness Timm's errors, which, with the exception of items (a),(c) and part of (f) below, are still reflected in his Exhibit 46(R):

a. In presenting energy equivalence, Dr. Timm equated the energy output (1271 MW) associated with the delivery of 4.05 million pounds per hour of steam to Dow while costing Dow's alternative at a steam output level of 2.8 million pounds per hour. (Tr.5450)

b. When calculating the needed capacity of the electric alternative, Dr. Timm used an 80% capacity factor instead of the 70% factor used for the Midland unit. (Tr.5465)

c. In presenting the capital costs of the electric alternative, Dr. Timm present worthed the costs of a low-sulfur EPA quality coal plant twice. (Tr. 5524-26)

d. While the electric alternative costed out is a low-sulfur EPA quality coal facility, the coal costs selected do not reflect EPA quality coal, and do not reflect real cost increases above inflation. This was done even though a study conducted under his supervision projected real price increases above inflation of two percent for coal delivered to Oregon. (Tr.5541-70, 6132, Intervenors Exh. 42, page 46)

e. In calculating the costs of operation and maintenance (O&M) for the electric alternative, Dr. Timm costed a low sulfur EPA quality coal plant which was not consistent with his coal pricing. (Tr.5569)

f. Dr. Timm has made a total cost evaluation, i.e., he disregards any investment already made in the Midland facility. However, in presenting the capital costs for the Dow alternative, he has subtracted Dow's investment associated with the Midland facility and has shown the net as representing the capital cost of the Dow alternative. (Tr.5581-4)

g. He has assumed that the plant could be available in six years. (Tr.5585)

h. He has excluded replacement power during the interim period required to construct the electric alternative. (Tr.5580)

Once these corrections were made, Midland had an economic advantage of $24.1 million even if the analysis was done on a total cost evaluation and replacement power was not considered.[338/] If, as is proper, replacement costs were taken into account and an incremental cost analysis performed, Midland would have an economic advantage of $1.7345 billion over Intervenors' alternative, even if Dr. Timm's 1983 schedule was assumed.[339/]

87. Not content to let well enough alone, Dr. Timm attempts to defend his Exhibit 46(R) in his rebuttal affidavit. His primary defenses are found in Paragraphs 35 and 36. Paragraph 35 states that the proper way to correct any error in coal costs is to change them, not the alternative. Once again, Intervenors miss the point--if a low sulfur coal alternative is examined, then that type of coal and that type of facility must be costed out; if a high sulfur coal alternative is examined, then that type of coal and that type of facility must be costed out. It is simply inappropriate to mix the type of coal and the type of facility as Intervenors have consistently done. Indeed, Dr. Timm's defense of his coal cost numbers in Paragraph 35 are a prime example of this approach since Dr. Timm continues to rely on studies which combine costs of different types of coal and do not separate old contracts from new contracts. Most importantly, Dr. Timm does not even address Mr. Brzezinski's final point

that his analysis "of a high sulfur coal electric alternative is conservative based on its cost advantage over a low sulfur coal alternative."[340/] Thus, once again Intervenors' attempt to resurrect Exhibit 46 has failed.

88. Intervenors' final argument is that the consideration of replacement costs and the resulting comparison of alternatives based on an incremental cost analysis is inappropriate because such an approach is really just a consideration of "sunk costs" which the Court of Appeals stated could not be considered. As set forth at pages 10-12 of Licensee's Responsive Brief, this "legal" argument is fallacious.

89. Thus, in the area of alternative plants, Licensee has demonstrated that Intervenors made very serious errors in calculating the costs of their alternative in an effort to demonstrate that it favorably compares with Midland. When the two alternatives are compared correctly, the Midland Plant has a definite economic advantage over the Intervenors' coal option.

IX. Conclusion

90. Licensee's analysis herein has shown that its June 13, 1977 Proposed Findings of Fact and Conclusions of Law are fully supported by the record, whereas those submitted by Intervenors are not. Therefore, this Board should adopt Licensee's Proposed Findings of Fact and Conclusions of Law, and enter the Order set forth therein at Paragraphs 114-115.

Respectfully submitted,

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FOOTNOTES

1. Howell testimony at 3, foll. Tr. 2074.

2. Licensee Exh. 7c at 29-30; Tr. 2088; Temple testimony at 8, foll. Tr. 220 (correction at Tr. 219).

3. Howell testimony at 5, foll. Tr. 2074.

4. Howell testimony at 6, foll. Tr. 2074.

5. Howell testimony at 6, foll. Tr. 2074.

6. Consumers Power Company (Midland Plant, Units 1 and 2), CLI-74-15, 7 AEC 311 at 311-12.

7. Consumers Power Company (Midland Plant, Units 1 and 2), CLI-74-15, 7 AEC 311 at 311-12.

8. Howell testimony at 3, 5-6, foll. Tr. 2074; Licensee Exh. 7c at 29-30; Tr. 2088; Temple testimony at 8, foll. Tr. 220 (correction at Tr. 219).

9. See Paragraphs 52-59 of Licensee's Findings, and Paragraphs 4-7, infra.

10. Temple testimony at 2, foll. Tr. 220. Tr. 2567, 2606-07, 2693-94; Board Exh. 1, 2.

11. Tr. 424-25, 428-29, 2606-07, 2717.

12. Tr. 2566-69, 2697-99; Temple testimony at 2-3, 5-6, foll. Tr. 220.

13. Temple testimony at 2-3, 5-6, foll. Tr. 220; Tr. 431-32; Dow's 2-28-77 Response No. 14 to NRC Staff's 1-27-77 Interrogatory.

14. Temple testimony at 8, foll. Tr. 220.

15. Tr. 2699.

16. Tr. 2617-19; Licensee Exh. 24.

17. Tr. 2693.

18. Tr. 2690.

19. Licensee's June 13, 1977 Brief at 10-17; Tr. 428-29, 2717.

20. Tr. 387, 418-19.

21. Tr. 2657-58, cf. Tr. 460.

22. Licensee's June 13, 1977 Brief at 10-17.

23. Tr. 2494, 2608, 2611-12, 2613-14.

24. Tr. 435.

25. Licensee's June 13, 1977 Brief at 10-17.

26. Dow's 5-2-77 Supplemental Response No. 1 (p. 2) to Intervenors' 12-27-76 Interrogatories.

27. Licensee's June 13, 1977 Brief at 10-17; Licensee's January 13, 1977 Brief at 7-14.

28. Licensee's Findings at Paragraphs 50, 58; Dow's Findings at Paragraph 5.

29. Dow's Findings at Paragraph 5; Licensee's Findings at Paragraph 58.

30. Dow's Findings at Paragraphs 4, 6, 7; Licensee's Findings at Paragraph 50, 51.

31. Dow's Findings at Paragraph 8; Licensee's Findings at Paragraph 62.

32. Licensee's Findings at Paragraph 62; Dow's Findings at Paragraph 9.

33. Licensee's Findings at Paragraph 62.

34. Tr. 2452-53.

35. Tr. 2718, 2722.

36. Tr. 2690, 2699, 2702, 2706; Temple testimony at 2-3, foll. Tr. 220.

37. Tr. 2690.

38. Brzezinski testimony, foll. Tr. 4959.

39. Brzezinski testimony at 3, foll. Tr. 4959.

40. Brzezinski testimony at 5, foll. Tr. 4959; Wilkinson testimony, foll. Tr. 4881.

41. Brzezinski testimony at 5, foll. Tr. 4959.

42. Calvert Cliffs' Coordinating Committee v. AEC, 449 F.2d 1109 (D.C. Cir. 1971).

43. Tennessee Valley Authority (Hartsville Nuclear Plant Units 1A, 2A, 1B, 2B), ALAB-367, 5 NRC 92, 103 n. 51 (January 25, 1977).

44. Northern States Power Company (Prairie Island Nuclear Generating Plant, Units 1 and 2), ALAB-244, 8 AEC 857, 862 (1974).

45. Boris testimony at 4, foll. Tr. 4912.

46. Boris testimony at 4, foll. Tr. 4912.

47. Boris testimony at 4, foll. Tr. 4912.

47A. Meltz testimony at 4, foll. Tr. 5065.

48. Meltz testimony at 7, foll. Tr. 5065.

49. Meltz testimony at 7, foll. Tr. 5065.

50. Licensee's June 13, 1977 Brief at 1017.

51. Boris testimony, foll. Tr. 4912; Meltz testimony, foll. Tr. 5065; Licensee's Findings at Paragraphs 59 and 79.

52. Licensee's Findings at Paragraph 102.

53. Tr. 2691.

54. Licensee's Findings at Paragraphs 59 and 79.

55. Licensee's Findings at Paragraph 63; NRC Staff Exh. 1-3.

56. Aeschliman v. NRC, 547 F.2d 622, 631 (D.C. Cir. 1976), cert. granted sub nom. Consumers Power Company v. Aeschliman, 45 U.S.L.W. 3570 (February 22, 1977).

57. Id. at 630-632; Licensee's June 13, 1977 Brief at 18-20.

58. Tennessee Valley Authority (Hartsville Nuclear Plant, Units 1A, 2A, 1B and 2B), LBP-77-__, 5 NRC __ (April 28, 1977), slip op. at 91.

59. 42 U.S.C. § 2232(b).

60. Tr. 3718; Licensee Exh. 32; Licensee's Findings at Paragraph 77.

61. Tr. 3719.

62. Licensee's Findings at Paragraph 77.

63. Licensee's June 13, 1977 Brief at 16.

64. Commonwealth Edison Company (LaSalle County Nuclear Station Units 1 and 2), ALAB-153, 6 AEC 821 (1973).

65. CCH Nuclear Reg. Rep. ¶ 30, 195.02 at p. 28,015.

66. CCH Nuclear Reg. Rep. ¶ 30, 195.03 at p. 28,016.

67. Licensee's June 13, 1977 Brief at 2-7.

68. Georgia Power Company (Alvin W. Vogtle Nuclear Plant, Units 1 and 2), ALAB-291, 2 NRC 404, 413 (1975). Licensee's June 13, 1977 Brief at 18-20.

69. Letters from R. Rex Renfrow III (Licensee's counsel) to the Board dated March 14, April 4, April 22, May 10 and May 25, 1977

70. Illinois Power Company (Clinton Power Station, Units 1 and 2), LBP-75-59, 2 NRC 579, 587 (1975).

71. Licensee's Findings at Paragraph 109.

72. Tennessee Valley Authority (Hartsville Nuclear Plant, Units 1A, 1B, 2A and 2B), ALAB-367, 5 NRC 92, 103 n. 51 (January 25, 1977).

73. Intervenors' Exh. 11; Tr. 1722, 1732.

74. Tr. 3448; Board Exh. 4 at 1.1-17; Licensee's Findings, Paragraph 15 at note 17.

75. Tr. 3246.

76. Tr. 3236-41.

77. Intervenors Exh. 22 at 2.

78. Intervenors Exh. 22.

79. Tr. 2000.

80. Tr. 1991, 1993.

81. Tr. 3799-800.

82. Tr. 3801.

83. See Tr. 1990, 3325.

84. "Subsection (b) of Rule 201 limits judicial notice to those indisputable 'adjudicative facts' which are either (1) 'generally known within the territorial jurisdiction of the trial court' or (2) readily verifiable 'by resort to sources whose accuracy cannot reasonably be questioned.'" 10 J. Moore, Federal Practice, §201.20 at ii-31 (2d ed. 1976). An example of the first type is the fact that a certain street is located in a business district, Varcoe v. Lee, 180 Cal, 338, 181 P. 223 (1919). An example of the second category of facts is the time at which sunset occurs in a particular city on a certain date, Oliver v. Hallett Const. Co., 421 F.2d 365 (8th Cir. 1970).

85. Intervenors' Exh. 41-45; Timm testimony at 65.

86. Tr. 5386, 5375-96.

87. Intervenors Exh. 43; Tr. 5985.

88. Tr. 5401-03; see, Tr. 5389-5400.

89. Tr. 5398-5403.

90. Tr. 5390, 5407; Intervenors Exh. 41, p. 35.

91. Tr. 5432.

92. Tr. 5959, 5942.

93. Tr. 5972, 5985-87.

94. Tr. 5987.

95. Feld Rebuttal testimony at 1, Special Transcript.

96. Feld Rebuttal testimony at 3-5, Special Transcript; see, Licensee's Findings, Paragraphs 27-30.

97. Feld Rebuttal testimony at 4-5, Special Transcript.

98. Licensee's Findings, Paragraph 28; Feld testimony at 16-", foll. Tr. 4375.

99. Licensee's Findings, Paragraph 15.

100. Feld testimony at 15-16, foll. Tr. 4375.

101. Feld testimony at 16, foll. Tr. 4375.

102. Feld testimony at 16-17, foll. Tr. 4375.

103. Feld testimony at 22-23, foll. Tr. 4375.

104. See, Licensee's Findings Paragraph 22 at note 71.

105. See, Licensee's Findings Paragraph 20 at note 64.

106. See, Licensee's Findings Paragraph 27 at note 95.

107. See, Licensee's Findings Paragraphs 16-18, 19 and 20.

108. Tr. 1918-20, 5397, 5409-10; see, Feld Rebuttal testimony at 2-3, Special Transcript.

109. Feld Rebuttal testimony at 2, Special Transcript; Tr. 5397, 5409-10, 5442-44.

110. Tr. 4472-73.

111. Tr. 1907; see, Bickel testimony, foll. Tr. 3995.

112. Tr. 1907-09.

113. Licensee's Findings, Paragraph 17 at note 34 and Paragraph 19.

114. Feld Rebuttal testimony at 4-5, Special Transcript.

115. Tr. 5443.

116. Tr. 5409-10.

117. Licensee Exh. 52; Tr. 5403-07.

118. Feld Rebuttal testimony at 2, Special Transcript; Tr. 1913.

119. Feld Rebuttal testimony at 2, Special Transcript.

120. Feld Rebuttal testimony, at Table foll. p. 2, Special Transcript.

121. Tr. 1913, 1933.

122. Licensee's Findings, Paragraphs 21-26; Tr. 5443.

123. Tr. 1959-63; see, Bickel testimony at 4-6, foll. Tr. 3995.

124. Tr. 2015-16.

125. Board Exh. 4 at 1.1-18.

126. Tr. 2474-75.

127. Licensee's Findings, Paragraph 31; Bickel testimony at 13-14, foll. Tr. 3995.

128. Tr. 2007-08.

129. Tr. 1984.

130. Tr. 1985.

131. Board Exh. 4 at 1.18; Bickel testimony at 11, foll. Tr. 3995.

132. Tr. 3323.

133. Intervenors Exh. 21.

134. Licensee's Findings, Paragraph 27 at note 92.

135. See, Paragraph ____, supra.

136. Feld Rebuttal testimony at 4, Special Transcript.

137. Feld Rebuttal testimony at 4, Special Transcript.

138. Feld Rebuttal testimony at 5, Special Transcript.

139. Feld Rebuttal testimony at 1, Special Transcript.

140. Licensee's Findings, Paragraphs 27-30.

141. Licensee Exh. 11.

142. Lapinski Rebuttal at 4-5, Special Transcript; see also Intervenors Exh. 18, as implying an excess generation requirement by showing a sum of Dow demand on Licensee's system and on self-generation which exceeds Dow's total peak demand.

143. Lapinski Rebuttal at 6, Special Transcript; Timm Affidavit at 8.

144. Tr. 5645.

145. Intervenors Exh. 18.

146. Tr. 5656-58.

147. Tr. 5655-56.

148. Intervenors Exh. 30; Tr. 5646, 5719-20.

149. Intervenors Exh. 30 at Table 3; Intervenors Exh. 18; Tr. 5714.

150. Tr. 5647-49, 5703-09.

151. Licensee Exh. 11; Intervenors Exh. 31A, 31E, 31G, 31I, 31K, 31M.

152. Intervenors Exh. 30.

153. Intervenors Exh. 30.

154. Intervenors Exh. 30; Intervenors Exh. 18; Intervenors Exh. 31A.

155. Lapinski Rebuttal testimony at 5-6, Special Transcript.

156. See also, Timm Affidavit at 5-6.

157. Tr. 5657-65.

158. Tr. 5704.

159. Tr. 5650.

160. Tr. 5665, 5703; Lapinski Rebuttal testimony at 5, Special Transcript.

161. Tr. 5665, 5670-71; Intervenors Exh. 30; Intervenors Exh. 11 at II (10).

162. Lapinski Rebuttal testimony at 5, Special Transcript.

163. Tr. 5649-50, 5705.

164. Lapinski Rebuttal testimony at 5, Special Transcript; Tr. 5704-05.

165. See also, Tr. 5649, 5651; Timm Affidavit at 7-8.

166. See, note to Table A of Timm Affidavit; Intervenors Exh. 18; Licensee's Findings, Paragraph 33.

167. Tr. 5325-26, 5330, 5333-34, 5354, 5507, 5764-65, 5767.

168. Tr. 5765-71; Tr. 6216; see, Licensee's Findings, Paragraph 34 at note 117.

169. Licensee's Findings, Paragraph 34 at notes 113-115.

170. See, Timm Affidavit at 9; Lapinski Rebuttal testimony at 7, Special Transcript.

171. Lapinski Rebuttal testimony at 7, Special Transcript.

172. Licensee's Findings at Paragraph 39.

173. Lapinski Rebuttal testimony at 7-8, Special Transcript.

174. Tr. 5769-70; Board Exh. 4 at 1.3-1.

175. Tr. 1794-95.

176. Tr. 5769-70; Board Exh. 4 at 1.3-1; see, Licensee's Findings, Paragraph 34 at note 118.

177. Tr. 1808-10.

178. Tr. 6217-19.

179. Tr. 1848-49; see, Licensee's Findings, Paragraph 41.

180. Heins Rebuttal testimony at 2, Special Transcript.

181. Lapinski Rebuttal testimony at 8, Special Transcript; Tr. 1787-89.

182. Heins Rebuttal testimony at 1, Special Transcript.

183. Licensee Exh. 11; Heins Rebuttal testimony at 2, Special Transcript.

184. See, Timm Affidavit at 27.

185. Licensee's Findings, Paragraph 35.

186. Tr. 1671; see, Licensee's Findings, Paragraph 35 at note 126.

187. Tr. 1671-72, 1677, 1682, 1849, 1852.

188. Lapinski Rebuttal testimony at 9, Special Transcript; see, Licensee's Findings, Paragraph 35.

189. Tr. 5359-64.

190. Tr. 5361.

191. See, Licensee's Findings, Paragraph 35 at note 124.

192. Tr. 5360.

193. Licensee's Findings, Paragraph 35 at notes 131-134.

194. Tr. 1850.

195. Tr. 6224-25, 6227-28, 6230.

196. Tr. 4779-84.

197. Tr. 5764-65, 5767-68; Licensee Exh. 11.

198. Tr. 5419-22, 5780, 5783.

199. Tr. 5242, 5323, 5790-5802.

200. Intervenors Exh. 57; Intervenors Exh. 32.

201. Intervenors Exh. 33.

202. Tr. 5903, 5912, 5913-23, 6124-27.

203. Lapinski Affidavit at 7.

204. Tr. 5913.

205. Tr. 5914-16.

206. Intervenors Exh. 57; Tr. 5914.

207. Lapinski Affidavit at 7.

208. Tr. 6257; see, Tr. 5901, 5915-16 to the contrary.

209. Lapinski Affidavit at 7-8; Lapinski Rebuttal testimony at 12, Special Transcript.

210. Lapinski Affidavit at 7-8.

211. Lapinski Affidavit at 7.

212. Lapinski Affidavit at 8.

213. Lapinski Affidavit at Attachment C.

214. Lapinski Affidavit at 8.

215. See, Timm Affidavit at 24; Intervenors Findings, Paragraph 71 at p. 95.

216. Lapinski Affidavit at 8.

217. Lapinski Affidavit at 8.

218. Tr. 5901.

219. Lapinski Affidavit at 8.

220. Lapinski Affidavit at 8.

221. Lapinski Affidavit at 8.

222. Tr. 5106, 5134-35; Lapinski Affidavit at 8.

223. Lapinski Affidavit, Paragraph 7 at pp. 6-7.

224. Gundersen Rebuttal testimony at 1, Special Transcript; see, notes 198 and 199 supra.

225. Lapinski Rebuttal testimony at 11-12, Special Transcript.

226. Tr. 5923.

227. See also, Timm testimony at 37, Special Transcript; Tr. 5243-44, 5884-85, 5891.

228. Heins testimony at 9, foll. Tr. 1648; Lapinski Rebuttal testimony at 12, Special Transcript; Gundersen Rebuttal testimony at 3, Special Transcript; Tr. 5884-85.

229. Tr. 5885-86.

230. Intervenors Exhs. 32, 33; Ringlee Affidavit at 16.

231. Ringlee Rebuttal testimony at 11-12, Special Transcript; Ringlee Affidavit at 11a.

232. Tr. 5886; Ringlee Rebuttal testimony at 11-12, Special Transcript; Ringlee Affidavit at 11a.

233. Ringlee Rebuttal testimony at 12, Special Transcript.

234. Tr. 5887-91; Lapinski Rebuttal testimony at 12-13, Special Transcript; Ringlee Rebuttal testimony at 11-12, Special Transcript; Ringlee Affidavit at 11-12.

235. Tr. 5897-99, 5902-03.

236. Ringlee Rebuttal testimony at 13, Special Transcript; Ringlee Affidavit at 14.

237. Ringlee Rebuttal testimony at 13, Special Transcript; Ringlee Affidavit at 13.

238. Ringlee Affidavit at 13.

239. Ringlee Affidavit at 13.

240. Intervenors Exhs. 32, 33; Tr. 5923-24; Lapinski Rebuttal testimony at 10-11, Special Transcript.

241. Tr. 4402-05; Feld Testimony at 5, foll. Tr. 4375.

242. Heins testimony, foll. Tr. 1648; Licensee Exhs. 11-13.

243. Tr. 5165-68.

244. Tr. 1660-61, 5164.

245. Tr. 5167; Gundersen Rebuttal testimony at 2-3, Special Transcript.

246. Gundersen Rebuttal testimony at 3, Special Transcript.

247. Gundersen Rebuttal testimony at 2, Special Transcript.

248. Licensee's Findings, Paragraph 39.

249. Heins Affidavit at 4.

250. Heins Affidavit at 4; see, Licensee's Findings, Paragraph 40 at note 160.

251. Heins Affidavit at 4.

252. Heins Affidavit at 4-5; see, Licensee's Findings, Paragraph 39 at note 159.

253. Heins Affidavit at 5.

254. Heins Affidavit at 5; Gundersen Supplemental testimony at 4-6.

255. Heins Affidavit at 5; Gundersen Supplemental testimony at 4-5.

256. Heins Affidavit at 5; see, Gundersen Supplemental testimony at 4.

257. Heins Affidavit at 5.

258. Heins Affidavit at 5-6; Gundersen Supplemental testimony at 6.

259. Licensee's Findings, Paragraph 45; Ringlee Rebuttal testimony at 10-11, Special Transcript; Ringlee testimony at 10, foll. Tr. 4801; Heins Affidavit at 4-5.

260. Gundersen Supplemental Testimony at 6.

261. Gundersen Supplemental Testimony at 4-6; Heins Affidavit at 5-6.

262. Licensee's Findings, Paragraph 83.

263. Licensee Exh. 16.

264. Licensee Exh. 16; Keeley testimony at III-4, foll. Tr. 3638.

265. [$\frac{5.5\%}{7\%}$ x $35.3 million = $27.73 million]

266. Keeley testimony at III-6-7, foll. Tr. 3638; Licensee Exh. 16.

267. Tr. 5595-98.

268. Tr. 5607-08.

269. Meltz Rebuttal testimony at 3, Special Transcript.

270. Tr. 5602, 5937-41.

271. Tr. 5612-30, especially at 5629-30.

272. Tr. 5612-30.

273. Tr. 5620.

274. Tr. 5630.

275. Tr. 5633-34.

276. Tr. 5634.

277. Tr. 5635-38.

278. Tr. 5878-81.

279. Tr. 5621-23.

280. Timm Affidavit at 8-9.

281. Intervenors Exh. 26.

282. Licensee's Findings, Paragraph 102 and note 393.

283. Tr. 5831-38.

284. Timm Testimony at 74, Special Transcript; Licensee Exh. 56.

285. Lapinski Affidavit at 2.

286. Tr. 5783.

287. Tr. 5790-92.

288. Tr. 5809-11; Lapinski Rebuttal Testimony at pp. 20-21, Special Transcript.

289. Lapinski Rebuttal Testimony at 21-25, Special Transcript.

290. Tr. 5829.

291. Tr. 5830.

292. Tr. 5866-68.

293. Tr. 6123.

294. Tr. 6124.

295. Lapinski Affidavit at 5-6.

296. Tr. 5790.

297. Wilkinson testimony at 1-10, foll. Tr. 4881.

298. Tr. 4522-38, especially 4538.

299. Testimony of Ronald L. Heiks (Jan. 6, 1977) before Michigan Public Service Commission at 3 (Document cited in Timm Testimony at 81-82).

300. Roberts testimony at 6 and Table 3, foll. Tr. 5099.

301. Timm testimony at 77, Special Transcript.

302. Lapinski testimony at 25, Special Transcript.

303. Tr. 5621-23.

304. Tr. 5530-31.

305. Tr. 5587-88.

306. Tr. 5587-88.

307. Exh. 46 and Tr. 5354 at 83-88.

308. Tr. 5446-75.

309. Tr. 5450-51.

310. Tr. 5450-52.

311. Board Exh. 4 at Table 11-1.

312. Tr. 5540.

313. Intervenors' Findings at Paragraph 79; Tr. 5465-72.

314. Tr. 5465-72.

315. Tr. 5468-69.

316. Tr. 5470-71.

317. Tr. 5541-70, 6132; Intervenors Exh. 42.

318. Tr. 5579-80.

319. Tr. 5580-82.

320. Tr. 5584.

321. Tr. 5585-87.

322. See also Brzezinski Affidavit at 6.

323. Tr. 5585-87.

324. Tr. 5541.

325. Tr. 5541.

326. Tr. 5544; Timm testimony at 75, Special Transcript.

327. Tr. 5547.

328. Tr. 5554-60.

329. Tr. 5551.

330. Tr. 5561-69.

331. Tr. 5549-51.

332. Tr. 5547; 5574-75.

333. Tr. 5576-77.

334. Tr. 5561-70.

335. Tr. 5871 et seq., 6260-61.

336. Tr. 6169-6178.

337. Tr. 6179.

338. Brzezinski Affidavit at p. 7.

339. Brzezinski Affidavit at pp. 7-8.

340. Brzezinski Affidavit at p. 8; and Licensee Exhs. 20 and 21.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
CONSUMERS POWER COMPANY	)	Docket Nos. 50-329
	)	50-330
(Midland Plant, Units 1 and 2)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the attached "Responsive Findings of Consumers Power Company" and "Responsive Brief of Consumers Power Company", dated July 14, 1977 in the above-captioned proceeding, will be served on the following by hand delivery the 15th day of July, 1977:

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The following have been served by deposit in the United States mail, first-class, this 14th day of July, 1977:

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