

RELATED CORRESPONDENCE

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of)	
)	
METROPOLITAN EDISON COMPANY, <u>ET AL.</u>)	
)	Docket No. 50-289-OLA
(Three Mile Island Nuclear)	ASLBP 83-491-04-OLA
Station, Unit No. 1))	(Steam Generator Repair)
)	

LICENSEE'S COMBINED REPLY TO JOINT INTERVENORS'
RESPONSE TO LICENSEE'S MOTION FOR SUMMARY
DISPOSITION, AND ANSWER TO JOINT INTERVENORS'
MOTION TO STAY HEARING

On February 24, 1984, Licensee moved for summary disposition of each of Joint Intervenor's contentions. Licensee's motion addressed Joint Intervenor's contentions in depth, setting forth separately for each contention all material facts as to which there is no genuine issue to be heard, and supporting its motion with detailed affidavits and references to relevant documents in intervenors' possession. Joint Intervenor responded to Licensee's motion on March 20, 1984, not by disputing Licensee's statement of facts or its analysis of the contentions, but rather by improperly proffering new allegations and facts. These new allegations and facts should have

been, but were not, disclosed to Licensee during the discovery process; many are outside the scope of Joint Intervenor's admitted contentions and of the hearing itself; and none raise a genuine issue to be heard.

I. OVERVIEW

As an initial matter, Licensee reiterates the fundamental proposition stated in its Motion for Summary Disposition that Joint Intervenor's are estopped from relying on any allegation in their opposition which they improperly failed to disclose to Licensee during the discovery process. Licensee submits that to freely excuse intervenor's surprise tactics would seriously undermine the integrity of the summary disposition process, which is designed to avoid unnecessary hearings. It would also undermine the Commission's discovery rules, which require parties to respond fully to all proper discovery inquiries (see 10 C.F.R. § 2.740(b)(1)), as well as the requirement that intervenor's fully assume the obligations attendant to participation in licensing proceedings. Duke Power Company (Catawba Nuclear Stations, Units 1 and 2), 17 N.R.C. 1041, 1046-47 (1983).

As noted, Joint Intervenor's have relied only on such improper new allegations;^{1/} they have not disputed any of the

^{1/} See discussion in the accompanying Motion for Leave to File Reply to Joint Intervenor's Response to Licensee's Motion for Summary Disposition at pp. 2-4 and nn.2-3.

facts stated by Licensee. Indeed, they have stated that they "do not take issue with the clear fact that sulfur contamination was immediately causative of the extensive tube failures observed in the TMI-1 steam generator tubes; or that the kinetic expansion process is acceptable as a method to reseal the tubes in the tube plates; or that the sulfur removal program is, in itself, acceptable." (Response at 1.) The facts set forth in Licensee's Motion for Summary Disposition must accordingly be deemed admitted for purposes of this proceeding, and summary disposition should be granted in Licensee's favor. See 10 C.F.R. § 2.749(a) ("All material facts set forth in the statement required to be served by the moving party will be deemed to be admitted unless controverted by the statement required to be served by the opposing party.")

Even if Joint Intervenors are permitted to rely on information which they improperly failed to produce during discovery, however, summary disposition in Licensee's favor should still be granted because the new information fails to raise any "genuine" issue as to a "material" fact. This is so first of all because many of the concerns raised by their answer are beyond the scope of the contentions admitted by the Board in its November 29, 1983 order as well as beyond the scope of the proceeding itself; in fact, Joint Intervenors have gone so far as to attempt to replace their contentions with the new, and significantly broader, assertion that the TMI-1 OTSGs "have

experienced a substantial operational history which can reasonably be expected to enhance intergranular attack . . . and susceptibility [sic] to cracking under conditions attendant to resumed plant operation." (Response at 1.) In a related vein, Joint Intervenors seek to raise the generic issue of how the safety of steam generators in general is affected by long-term operation. This proceeding is concerned with whether TMI-1's steam generator tubes have been properly repaired. It does not encompass a generic issue such as that posited by Joint Intervenors, which is simply not an appropriate issue in this individual licensing proceeding.^{2/}

The allegations made by Joint Intervenors which arguably are within the scope of the contentions are also deficient. Many are quotations taken out of context, which, when

^{2/} See Wisconsin Electric Power Co. (Point Beach Nuclear Plant, Units 1 and 2), ALAB-739, 18 N.R.C. 335 (1983), upholding the dismissal of contentions generally related to steam generator operation in a licensing amendment relating to the repair of steam generator tubes by sleeving. The Appeals Board quoted with approval the Licensing Board's explanation that

This is not an application to build or operate a nuclear power reactor. In an amendment proceeding, the relationship of steam generators to the remainder of the plant is not germane.... The test of relevance [therefore] ... is to ask whether an issue is relevant to "how the sleeving program would cause problems" or whether it reflects "unfavorably on the safety of sleeving."

18 N.R.C. at 339, quoting LBP-82-88, 16 N.R.C. 1335, 1342 (1982).

placed in proper context, raise no genuine issue of fact. Still others are not germane to the TMI-1 steam generators, and therefore are not material.

Joint Intervenor's attempt to defeat summary judgment must fail as well because their opposition does not fulfill the procedural requirements of 10 C.F.R. § 2.749. Intervenor's have failed to file a statement of material facts as to which they assert there is a genuine dispute. This omission "is not merely a procedural technicality, but ... is of substantial significance", because the statement of facts provides the basis for the Board's "evaluat[ion of] the merits of a motion for summary disposition." Pacific Gas & Electric Co. (Stanislaus Nuclear Project, Unit No. 1), LBP-77-45, 6 N.R.C. 159, 163 (1977). Moreover, where, as here, Licensee has supported its motion with affidavits, intervenor's can defeat the motion only with affidavits or other evidence which would be admissible to show that there is a genuine issue of fact. 10 C.F.R. § 2.749(b). Allegations, quotations taken out of context, and mischaracterizations of Licensee's affidavits fall far short of satisfying this evidentiary requirement.

II. REPLY TO SPECIFIC ALLEGATIONS

Licensee has repeated below Joint Intervenor's allegations verbatim, and provided a brief explanation as to why no genuine issue has been raised by the allegation.

A. Allegations of General Applicability (Response at 2-3)

The first four allegations made by Joint Intervenor (as well as many that follow) are based on an EPRI report entitled "Examination of Tube Samples 21-46 and 28-45 from the Ginna Nuclear Plant for Intergranular Attack" (February 1983) (hereafter "EPRI NP-2877"). The potential issues raised by EPRI NP-2877 are inapposite for two reasons: (1) The EPRI study was addressing those factors which cause or contribute to secondary side IGA,^{3/} whereas the TMI-1 OTSGs experienced primary side IGA. In light of the vast differences between the secondary and primary sides in terms of water chemistry and geometry (the secondary side is replete with crevices where . . . corrodants can concentrate), the EPRI study's concerns in no way raise similar issues in connection with the TMI-1 corrosion. (2) The Inconel 600 tubes involved in EPRI NP-2877 were mill annealed, whereas the TMI-1 tubes are sensitized Inconel 600, i.e., had been subject to stress relief heat treatment after mill annealing. See Giacobbe Affidavit, ¶ 23. This sensitization altered the properties and characteristics of the alloy, and most importantly, increased its resistance to the most common types of stress corrosion. Licensee's Motion for Summary Disposition at 95; Giacobbe Affidavit, ¶ 22. The

^{3/} The EPRI Report uses the more generic term "intergranular attack" to encompass both IGSAC and non-stress-assisted IGA.

properties of mil. annealed Inconel 600 therefore cannot be attributed to sensitized Inconel 600. It is thus evident that these new allegations are generic in nature, with no unique relationship to the TIM-1 steam generator tube repairs. They are not encompassed within the scope of Joint Intervenor's three admitted contentions and neither the allegations nor the documents cited in support were identified in response to Licensee's discovery requests.

As our discussion of the individual allegations will make evident, these factors compel the conclusion that the EPRI report does not raise any genuine issue material to the efficacy of the repair of the TMI-1 steam generators.^{4/}

First Allegation

Inconel Alloy 600 tubing, originally in the "mill annealed" condition, appears to undergo changes in its microstructure when in PWR service for greater than 10,000 hrs... [Response at 2.]

Reply

As explained above, this reference is inapposite because it concerns mill annealed, not sensitized, Inconel 600. It also improperly raises the generic issue of the effect of

^{4/} Because the EPRI report was a simple examination, it did not purport to make findings or even predictions as to what did in fact cause the corrosion in the Ginna Plant. Rather, the study merely identified areas for future inquiry based on the chemicals and conditions found. EPRI NP-2877 at iii, iv, 4-8. It is thus questionable whether the Ginna study would itself raise a genuine issue of fact even if it were apposite.

long term operation on the safety of steam generators, which is beyond the scope of this proceeding. In any case, analysis of the TMI-1 tubes themselves demonstrated that there had been no significant change in the metal's microstructure. Giacobbe Affidavit, ¶ 142.

Second Allegation

Impurity elements such as N, S, P or B may be diffusing to the grain boundaries during service and may lead to preferential [sic] IGA when exposed to aggressive chemicals... [Response at 2.]

Reply

The EPRI discussion cited by Joint Intervenors refers to caustic IGA, which occurs under the conditions and in the presence of caustic chemicals found on the secondary side. EPRI NP-2114-SR at S-1; EPRI NP-2877 at S-1, 4-12. Neither the conditions nor the chemicals necessary for caustic IGA are present on the primary side. See Giacobbe Affidavit, ¶ 65. Moreover, sensitized Inconel 600 is highly resistant to caustic corrosion. Id. at ¶ 64. This EPRI reference accordingly raises no genuine issue of material fact here.

Third Allegation

Hydrogen embrittlement...might occur through the interaction of hydrogen and a segregated impurity element such as sulfur in the alloy grain boundaries... [Response at 2.]

Reply

There is no question but that hydrogen embrittlement is an issue relevant to operation of steam generators; however, Joint Intervenor's have pointed to no evidence which suggests that hydrogen embrittlement has any relevance to the corrosion in issue in this proceeding. That issue is simply beyond the scope of the instant proceeding.

Joint Intervenor's' allegation is no more than a misleading quotation taken out of context. Significantly, the EPRI Report first cautions that "Inconel Alloy 600 is relatively resistant to [hydrogen embrittlement] type of attack." Id. at 4-11. It then notes that such embrittlement "might" occur on the secondary side, where "hydrogen can be present in the crevices of the affected steam generators due to the secondary side water treatment... and possibly corrosion of the carbon steel tubesheet." Ibid. The primary side environment, with its absence of crevices or other gas-collecting pockets (see Slear Affidavit ¶ 4, 5, 6, 7) and the absence of the factors necessary for the galvanic coupling associated with hydrogen embrittlement (see discussion infra p. 10), simply bears no resemblance to the environment described by EPRI. That study's findings therefore are not germane to Joint Intervenor's' contentions.

Fourth Allegation

Furthermore, the tubing is galvanically coupled to the tube sheet which would probably act as a cathodic polarizer. [Response at 2.]

Reply

The phenomenon of galvanic coupling^{5/} is outside the scope of the admitted contentions. It is an issue in the case of the IGA involved in EPRI NP-2877 because carbon steel components are adjacent to the Inconel 600 components on the secondary side at the Ginna plant. See EPRI NP-2877 at 4-11, 4-12. By contrast, on the primary side at TMI-1, the surface of virtually all of the RCS components exposed to the reactor coolant is Inconel or electropotentially compatible material. See Slear Affidavit, ¶ 5. Thus, the potential for galvanic coupling is not a genuine issue with respect to TMI-1's primary side IGA.

Fifth Allegation

Babcock & Wilcox OTSG Corrosion Test Program-Final Report (May 9, 1983) also states that among "other factors that may have contributed to the extent of intergranular attack" was "metallurgical conditioning of the tubing during approximately 5 years of plant operation at 605°F." [Response at 2.]

^{5/} "Galvanic coupling" occurs where two different materials are connected in a solution of ions so as to permit the flow of electrons between the two materials. This results in acceleration of the corrosion of the less resistant material (and deceleration of the corrosion of the more resistant material).

Reply

As part of its analysis of the susceptibility of sensitized Inconel 600 to IGSAC, the B&W corrosion test program examined both unused archive tubing and tubing removed from the TMI-1 OTSGs. J.V. Monter and G.J. Theus, "TMI-1 OTSG Corrosion Test Program - Final Report," B&W Report RDD 83:5433-01-01:01, at pp. 4, 11 (May 9, 1983). The statements quoted by Joint Intervenors do nothing more than indicate that changes in surface oxide occur with use; as a consequence, the metal which has been in service may undergo more extensive intergranular attack than unused tubing -- if the requisite corrodant is present (which we have demonstrated is not the case here). This is hardly surprising; such oxide changes occur in all steam generators during normal operation, and its affect on the metal is taken into account in establishing design and licensing basis criteria. It is beyond the scope of this proceeding, however, to litigate the generic question of whether these criteria properly take into account metallurgical surface conditioning and other effects attendant to prolonged operation of steam generators. Further, the allegation is not material to any of the contentions here in issue.

Sixth Allegation

[T]he industry experience of an increasing rate of tube failures strongly suggest[s] that we are grappling with a generic issue of great significance. [Response at 2.]

Reply

The existence of an "increasing rate of tube failures" is a mere unsupported allegation, insufficient to defeat a motion for summary disposition. 10 C.F.R. § 2.749(b). Moreover, Joint Intervenors themselves acknowledge that their concern is a generic one, and is not specifically related to the efficacy of the repair of the TMI-1 OTSGs. To the contrary, there has only been one other identified instance of IGSAC in sensitized Inconel 600 OTSGs, and that occurred on the secondary side; all other identified instances of IGSAC involve U-bend steam generators which used mill annealed tubing. See NRC Staff's Answer to Lee et al's Interrogatories of NRC Staff (Set 1), Response to Interrogatory 1 (February 16, 1984).

B. Allegations Relating to Contention 1(2)

Contention 1(2) expresses the concern that active forms of sulfur can be generated from the benign sulfur remaining on the tube surfaces after cleaning.

Seventh Allegation

[W]e hold that simple reliance on lead tests is an inadequate control procedure.
[Response at 3.]

Reply

Apart from the fact that it is an unsubstantiated allegation which cannot defeat summary disposition (10 C.F.R. § 2.749(b)), Joint Intervenors' suggestion that "simple reliance" on lead corrosion tests is inadequate to control

reinitiation does not raise a genuine issue of fact because Licensee is not, in fact, relying on the lead tests as the sole control measure. To the contrary, Licensee has imposed a series of operating controls, predicated on a thorough analysis of the thermodynamic stability of the various sulfur forms, which ensure that corrosive levels of aggressive sulfur compounds will not be formed during hot operations, cooldown or shutdown. See Giacobbe Affidavit, ¶¶ 102-107, 115-116. Licensee has also implemented a series of administrative controls to ensure that additional sulfur compounds and other potential corrodants are not introduced into the RCS. See id. at ¶¶ 108-114. The lead corrosion tests simply provide corroboration that under the conditions attendant to operation, corrosion will not reinitiate.^{6/}

Eighth Allegation

It is suggested that copper may function akin to a synergist (EPRI NP-2877, Pg. 4-9, 4-3, S-2). [Response at 3.]

Reply

Joint Intervenors have mischaracterized the statements pertaining to copper in EPRI NP-2877. Even a casual reading of that report shows that EPRI has merely noted that

^{6/} Joint Intervenors also contend that Licensee's effort to define potential mechanisms for reinitiation have been inadequate. Again, this is an unsubstantiated allegation inadequate to defeat summary disposition. 10 C.F.R. § 2.749(b).

copper might play a role in chemical reactions which produce free hydrogen, which could in turn lead to hydrogen embrittlement. EPRI NP-2877 at 4-3, 4-9, 4-12. The EPRI Report does not in any way suggest that copper may function as a synergist.

Even if copper did function as a synergist, Joint Intervenors' allegation raises no genuine issue as to the possibility of IGSAC reinitiation at TMI-1 because Joint Intervenors have shown no relationship of their allegation to TMI-1. In fact, the TMI-1 OTSG tubes are free of any detectable copper precipitants. Licensee performed approximately 100 analyses of the tube surfaces, none of which showed even a trace of copper. "TMI-1 OTSG Failure Analysis Reports," GPUN TDR-341, Rev. 1, at 79-80, Table VI-5; Giacobbe Affidavit, ¶¶ 10-14, 62.

Ninth Allegation

[O]ne or more of a host of system contaminants, including sulfur, may drive the electrochemical potential of the alloy into a corrosion susceptible region (EPRI NP-2877, Pg. 4-6-8). [Response at 3.]

Reply

Joint Intervenors, having already conceded that sulfur was the immediate causative agent of the IGA experienced at TMI-1, merely state that a number of contaminants may make Inconel 600 more susceptible to corrosion. However, the EPRI Report cited in support of Joint Intervenors' allegation states that the various chemical contaminants which were found on the Ginna tube samples "may or may not" contribute to the process

of IGA and that this might occur because the contaminant(s) increase the electrochemical potential of the alloy. See EPRI Report NP-2877 at 4-6. This equivocal statement is of course consistent with that report's purpose, namely, to chemically analyze the tubes to identify substances for further study. See n. 4, supra.

Licensee similarly evaluated the TMI-1 reactor coolant system to identify all of the possible causative agents. Giacobbe Affidavit ¶¶ 10-14. Those that were potential causes of IGSAC were carefully evaluated, and all but sulfur were ruled out because the conditions under which those substances cause IGSAC, or the concentration of the substances needed to cause the damage, were not present. See Giacobbe Affidavit, ¶¶ 62-72. Moreover, the potential corrodants have been included in corrosion tests without any reinitiation of IGSAC. See ibid. EPRI's generalized statement that contaminants "may or may not" increase susceptibility to corrosion is hardly sufficient to raise a genuine dispute as to these facts.

Tenth Allegation

Licensee states that "... active, or harmful forms of sulfur will not be generated and cause reinitiation of the cracking mechanism." (Giacobbe Affidavit pg. 113 at 191).... [Yet] [o]nly 50-80% of the sulfur has been removed. (Emphasis supplied by intervenors). [Response at 3-4].

Reply

Joint Intervenor^s have again excised their quotation out of context. As the Giacobbe Affidavit makes clear (at ¶¶ 100-101),^{7/} Licensee does not contend that no metastable sulfur whatsoever will be generated, but rather that the peroxide cleaning process and operational controls will ensure that active, harmful forms of sulfur will not be generated in the concentration and under the conditions necessary to cause IGSAC. Because Joint Intervenor^s do not dispute the latter proposition, they have raised no genuine issue of fact.^{8/}

C. Allegations Relating to Contention 1(3)

Contention 1(3) asserts that "morphological changes" in the inner tube surface could be precursors of IGSAC. Joint Intervenor^s have previously identified the "morphological changes" which they believe might be such precursors as IGA

^{7/} Joint Intervenor^s' reference is actually to Licensee's statement of facts.

^{8/} Joint Intervenor^s also note that "[r]einitiation is to be controlled by lithium addition." Apart from the fact that this statement is inaccurate, it is beyond the scope of this proceeding. The Board rejected Joint Intervenor^s' proposed contention that Licensee improperly relied on lithium to control reinitiation. See Board Order of November 29, 1983 at 19-21.

The intervenor^s additionally state that "Ph. [sic] can range from 4.6 to 8.5, allowing S⁻² [sulfides] to be generated." But the Giacobbe Affidavit evidences that sulfides are non-corrosive. Affidavit at ¶ 100. Joint Intervenor^s have not alleged to the contrary, much less proffered the requisite supporting factual documentation to raise a genuine issue of fact. 10 C.F.R. § 2.749(b).

islands. See Joint Intervenors' Response to Licensee's Interrog. 1(3)-2 (January 16, 1984).9/

Eleventh Allegation

[Licensee relies on] the absence of laboratory failures at IGA sites as the foundation for asserting that the IGA islands will not mature into IGSAC. [Response at 4.]

Reply

Intervenors' suggestion that Licensee relies only on the absence of "failures" (presumably through-wall cracks) in laboratory tests to dispute Contention 1(3) is an unsupported allegation that cannot defeat summary disposition. See 10 C.F.R. § 2.749(b). Nor could Joint Intervenors have supported this allegation if they had attempted to do so; as indicated in its summary disposition motion, Licensee determined that IGA will not propagate into IGSAC on the basis of (1) the well established scientific principle that IGA propagation, like IGSAC, requires the presence of a contaminant in corrosive quantities, Giacobbe Affidavit, ¶¶ 132-133; (2) metallurgical and visual examination of the IGA in the TMI-1 OTSGs, id. at ¶¶ 137-141; (3) an analysis of the effect of the IGA on mechanical properties of the tubes, id. at ¶¶ 142-144; (4) imposition of control strategies to prevent the propagation of IGA, id. at

9/ Intervenors now assert that IGA islands were only cited as "obvious examples" (Response at 4) but have pointed to no other changes which could be precursors of IGSAC.

¶¶ 108-116, 145; and finally (5) confirmatory testing, id. at ¶¶ 146-147. Joint Intervenorors have pointed to no defect in any of the five facets of Licensee's analysis -- including the laboratory tests. Their allegation is thus patently frivolous and raises no genuine issue of fact.

Twelfth Allegation

[Because] "metallurgical conditioning of the tubing" has occurred which . . . "may have contributed to the extent of intergranular attack" . . . [to] hold that changes in [the tubes] microstructure will not be of a continuing nature defies reason. [Response at 4.]

Reply

The effect of the service life of tube materials on steam generator safety is a generic issue beyond the scope of this proceeding. In any case, as indicated by the title of the relevant section of the B&W report ("Surface Condition"), the "metallurgical conditioning" experienced at TMI-1 is no more than a surface phenomenon. Contrary to Joint Intervenorors' claim, the analyses in the record have found that there has been no significant change in the tubes' microstructure. Giacobbe Affidavit ¶¶ 142-144. Inasmuch as Joint Intervenorors have not presented any evidence showing that changes in the tubes' microstructure have occurred or are likely to occur, Licensee's facts must be deemed admitted and summary disposition granted on this issue.

D. Allegations Relating to Contention 1(5)

As admitted, Contention 1(5) states that Licensee has not studied the "possible effects of potential stress cracking agents other than active forms of sulfur...in relation to the initiation of IGSCC." Joint Intervenor now attempt to more broadly phrase the contention to encompass any "future significant failure scenarios" caused by substances other than sulfur. Joint Intervenor are of course bound by the scope of the admitted contention.

Thirteenth Allegation

Clearly, Licensee acknowledged lack of understanding of even the sulfur-induced cracking:

- "It was apparent that we were primarily dealing with an intergranular stress assisted failure mechanism." (Giocobbe [sic], Pg. 3(7)). Licensee discusses no secondary mechanisms.
- Whereas Licensee asserts that "stress assisted cracking always produces cracks perpendicular to the tensile stress," the cracking was found to be "almost exclusively circumferential". (Giocobbe, Pg. 7(19)). Can Licensee explain these anomalies [sic]?
- "...sulfur, perhaps coupled with chloride, were possible causative [sic] agents." (Giocobbe, Pg. 9(24)). (Emphasis added by Joint Intervenor.) [Response at 5.]

Reply

Once more, Joint Intervenor have sought to create an issue by quoting statements out of context. Intervenor's attempt to take solace from the fact that Mr. Giacobbe's first

statement was not absolutely unequivocal is to no avail. Mr. Giacobbe was relating the progressive history of Licensee's investigations; he qualified his statement because it referred to Licensee's thought processes during the initial stages of the investigation of the failure. See Giacobbe Affidavit, ¶ 7. As the failure analysis progressed, Licensee's conclusion that the failure mechanism was IGSAC became unequivocal. See id. at ¶ 8.10/

Joint Intervenors' perceived inconsistencies between Licensee's assertion that stress assisted cracking "always" produces cracks perpendicular to the tensile stress and its recognition that a few cracks were not circumferential (Giacobbe Affidavit, ¶ 19) is equally frivolous. In the next paragraph of his affidavit, Mr. Giacobbe notes that the only cracks which were not circumferential were at the tube ends. He explained that "[t]his orientation is expected since the tube ends are subject only to residual circumferential stresses" (id. at ¶ 20), i.e., are not subject to the axial tensile stress which would produce circumferential cracks.

Nor does Licensee's recognition that chloride possibly played a causative role raise a genuine issue of fact. Again, that statement was a tentative one, made during the

10/ The allegation that failure mechanisms other than IGSAC are involved is in any case beyond the scope of the admitted contention.

course of the investigation. As Mr. Giacobbe explained, Licensee ultimately concluded that it is unlikely that chloride played a significant role because (1) Inconel 600 is virtually immune to chloride-induced IGSAC; (2) only low levels of chloride were found; and (3) chloride in amounts as high as 10 times the permissible level did not cause IGSAC. Id. at ¶¶ 12, 66, 69. In any case, even if chloride did contribute to the sulfur-induced IGSAC, Licensee demonstrated that the presence of both chloride and sulfur within the levels set by its administrative limits will not cause reinitiation of IGSAC. Giacobbe Affidavit, ¶ 69. Joint Intervenors have come forward with no evidence contrary to Licensee's averments, and thus have failed to raise a genuine issue of material fact with respect to the role of the chloride.

Fourteenth Allegation

The Ginna report (EPRI NP-2877) suggests "a link between enhanced chlorine levels on IGA crack surfaces and extensive IGA ..." (Pg. 4-5). [Response at 5.]

Reply

For the reasons discussed in response to the Thirteenth Allegation, the suggestion that there "may" be a link between "enhanced" chlorine levels on the crack surfaces of secondary side IGA of mill annealed Inconel 600 raises no issue as to the role of chlorine here. Moreover, as previously indicated, the EPRI report was merely seeking to identify

chemicals present on the Ginna tubes for future study as causative agents.

Allegations Fifteen through Twenty raise issues which Licensee purportedly "overlooked" (Response at 6). That assertion is somewhat amusing given the fact that Joint Intervenor received the reports which raise these issues from Licensee in response to Joint Intervenor's discovery request for all documents that Licensee considered in its failure analysis.

Licensee's Response to Joint Intervenor's Interrogatory 32 (January 31, 1984). Licensee reviewed EPRI documents NP-2877, NP-2114-SR and NR-3070-LD as part of its exhaustive literature search but found the documents concerned corrosion phenomena which are not applicable to the evaluation of the IGA of sensitized Inconel 600 experienced at TMI-1. ORNL/TM-8544, on the other hand, documents work performed by Licensee as part of the failure analysis.

Fifteenth Allegation

"Electrochemical potential plays an important role in the SCC resistance of alloy 600...the change from intergranular to transgranular SCC at cathodic potentials...need to be clarified, especially the role of hydrogen on failure mode." (EPRI NP-2114-SR, Pg. S-2). [Response at 6.]

Reply

Joint Intervenor has again mischaracterized the data at their disposal. This passage and report concern the susceptibility to IGSCC of mill annealed Inconel 600 tubes in

high-temperature secondary side caustic solutions. This analysis is inapposite to the IGSAC experienced at TMI-1, because it involved IGSAC on the primary side of sensitized Inconel 600 tubes in non-caustic solution. See Reply to Allegations of General Applicability, supra, pp. 6-7. In addition, the discussion is inapposite given the geometry on the primary side of the TMI-1 steam generators. See Reply to Third Allegation supra, pp. 8-9. Finally, the issue of the resistance of various alloys is a generic issue outside the scope of the admitted contentions and this proceeding.

Sixteenth Allegation

"Future research to explain SCC failures of alloy 600 should concentrate on grain boundaries...examining the influence of minor elements and microstructural aspects... (and)...the effect of cyclic stresses superimposed on residual stresses...." ([EPRI NP-2114-SR], Pg. S-4). [Response at 6.]

Reply

Joint Intervenors have again based their allegation on an inapposite foundation. This EPRI Report's recommendation is directed toward future study of IGSAC of mill annealed Inconel 600 tubes from U-bend steam generators, in high purity water and caustic environments. EPRI NP-2114-SR at S-2. Licensee has demonstrated that there is simply no relationship between these environments and that at TMI-1 on the primary side, where the IGSAC occurred. See discussion supra, pp. 6-7, 9; Giacobbe Affidavit ¶¶ 59-61, 64-65; EPRI NP-2114-SR at S-1.

Absent an evidentiary showing to the contrary -- which Joint Intervenors have not made -- this allegation in no way addresses or refutes any of the material facts presented by Licensee. It is, moreover, outside the scope of the admitted contentions and this proceeding.

Seventeenth Allegation

"Copper ... is a possible polarizing agent which could alter corrosive response." (EPRI NP-2877, Pg. 4-3). "Sporadic traces of copper may be associated with severe IGA cracking." (Id., pg. S-2)." (Emphasis supplied by intervenors). [Response at 6.]

Reply

Licensee has previously demonstrated there is no genuine issue as to the role of copper in the IGSAC of the TMI-1 steam generators. See Reply to Eighth Allegation, supra, pp. 13-14.

Eighteenth Allegation

"The tubing is galvanically coupled to the tubesheet which would probably act as a galvanic polarizer." ([EPRI, NP-2877], Pg. 4-12). [Response at 6.]

Reply

Licensee has previously demonstrated that this issue is outside of the scope of this proceeding and that there is no genuine issue as to the role of galvanic coupling in the IGSAC of the TMI-1 steam generators. See Reply to Fourth Allegation, supra, p. 10.

Nineteenth Allegation

"Relatively large grain sizes appeared to contribute to severe IGA..." (EPRI NP-3070-LD, Abstract). [Response at 6.]

Reply

Again, this issue is outside of the scope of the admitted contention; the general question of grain size is unrelated to the proper identification of the causative agent.

The quotation is also inapposite. The statement quoted by Joint Intervenors actually reads as follows:

"[r]elatively large grain sizes appeared to contribute to the severe IGA on the second tube [at the Ginna Plant]." EPRI NP-3070-LD (May 1983), at v. That tube was in the mill annealed condition and was not sufficiently sensitized for the polythionic acid-type attack to which it was subjected during the caustic solution secondary side analysis. Id. at v. Neither the material tested nor the chemical environment analyzed in EPRI NP-3070-LD is relevant to the evaluation of the conditions experienced at TMI-1. This was confirmed by Licensee's analyses which (contrary to Joint Intervenors' suggestion) specifically evaluated the grain size of the tube samples. Licensee found there was no correlation between grain size and IGA. See TDR-341 at 77 (which was provided to intervenors during discovery).

Joint Intervenors have proffered no factual information evidencing any linkage between large grain size and the

IGA of TMI-1 OTSG tubes. They accordingly have raised no genuine issue of fact with respect to this question.

Twentieth Allegation

"We conducted tests with different heats of the alloy, but the most susceptible material tested was a tube removed from one of the (TMI) Unit No. 1 steam generators. If this tube is representative..." (ORNL/TM 8544, Abstract). [Response at 6.]

Reply

Joint Intervenor's quotation is from a report issued by Oak Ridge Laboratories in conjunction with tests designed to evaluate the susceptibility of Inconel 600 to sulfur-induced IGSAC. Like the B&W tests discussed supra, these tests used both actual TMI-1 OTSG tubes and archive tubes which had not been in service; also like the B&W tests, the Oak Ridge tests found conditioned metal to be more susceptible to IGSAC than the archive tubes. Significantly, however, 5 ppm thiosulfate was necessary to cause cracking of even the "most susceptible" of the tubes. ORNL/TM 8544 at 26. This report thus raises no genuine issue as to whether IGSAC will occur under the conditions attendant to operation at TMI-1, most notably, the 0.1 ppm sulfate control level. See Giacobbe Affidavit, ¶¶ 108-116. In any case, as previously noted, the effect of service life on steam generator safety is a generic issue outside the scope of this proceeding.

III. ANSWER TO MOTION TO STAY

Joint Intervenors maintain that the instant proceeding should be stayed "until an industry consensus can be developed" regarding the likelihood of IGSAC recurrence at TMI-1 because of the "lack of understanding of many parameters which influence" IGA and the "general nature of the issue". Licensee opposes intervenors' motion first of all because the suggested purpose of the stay -- development of an industry consensus on various unspecified issues -- is at odds with the Board's obligation to adjudicate Licensee's amendment request. Equally significant, as our discussion above of their specific allegations makes clear, the request for stay should be denied because Joint Intervenors' suggestion that there is a lack of understanding of this issue is wholly unfounded. In fact, the IGSAC that occurred at TMI-1 was exhaustively analyzed, its cause conclusively established, and multiple controls imposed to prevent its recurrence. For these reasons, Joint Intervenors' attempt to indefinitely postpone resolution of this proceeding should be rejected out of hand.

IV. CONCLUSION

For the foregoing reasons and those stated in Licensee's Motion for Summary Disposition, there are no genuine issues of fact requiring adjudication of Joint Intervenors' Contentions 1(2), 1(3), and 1(5). The dismissal of these

contentions is therefore warranted as a matter of law, and summary disposition in Licensee's favor should be granted. Intervenor's motion for stay should be denied.

Respectfully submitted,

SHAW, PITTMAN, POTTS & TROWBRIDGE

Bruce W. Churchill
George F. Trowbridge
Bruce W. Churchill
Diane E. Burkley
Wilbert Washington II

1800 M Street, N.W.
Washington, D.C. 20036
(202) 822-1000

Dated: April 4, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of)	
)	
METROPOLITAN EDISON COMPANY, <u>ET AL.</u>)	Docket No. 50-289-OLA
)	ASLBP 83-491-04-OLA
(Three Mile Island Nuclear Station,)	(Steam Generator Repair)
Unit No. 1))	

CERTIFICATE OF SERVICE

I hereby certify that copies of "Licensee's Combined Reply to Joint Intervenors' Response to Licensee's Motion for Summary Disposition, and Answer to Joint Intervenors' Motion to Stay Hearing," dated April 4, 1984, were served upon those persons on the attached Service List, by deposit in the United States mail, postage prepaid, this 4th day of April, 1984.

Diane E. Burkley
Diane E. Burkley

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Station, Unit No. 1) (Steam Generator Repair)

SERVICE LIST

Sheldon J. Wolfe
Administrative Judge
Chairman, Atomic Safety and
Licensing Board
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Dr. David L. Hetrick
Administrative Judge
Atomic Safety and Licensing Board
Professor of Nuclear Engineering
University of Arizona
Tucson, Arizona 85271

Dr. James C. Lamb, III
Administrative Judge
Atomic Safety and Licensing Board
313 Woodhaven Road
Chapel Hill, North Carolina 27514

Richard J. Rawson, Esq.
Mary E. Wagner, Esq.
Office of Executive Legal Director
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Atomic Safety and Licensing Appeal
Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Docketing and Service Section (3)
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Joanne Doroshow, Esq.
Louise Bradford
Three Mile Island Alert, Inc.
315 Pepper Street
Harrisburg, Pennsylvania 17102

Jane Lee
183 Valley Road
Etters, Pennsylvania 17319

Norman Aamodt
R. D. 5, Box 428
Coatesville, Pennsylvania 19320