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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION SEP 27 11:49

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
)	
COMMONWEALTH EDISON COMPANY)	Docket Nos. 50-454 OL
)	50-455 OL
(Byron Nuclear Power Station,)	
Units 1 & 2))	

OFFICE OF SECRETARY
DOCKETING & SERVICE
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REPLY TO INTERVENORS' PROPOSED
SUPPLEMENTAL INITIAL DECISION

In accordance with the schedule established by the Atomic Safety and Licensing Board ("Licensing Board"), Commonwealth Edison Company ("Applicant" or "CECo") submits this reply to Intervenor's September 18 Proposed Supplemental Initial Decision. This reply addresses only those areas where substantive differences exist between the respective positions of the Applicant and Intervenor. We have not replied to Intervenor's conclusory findings (e.g. Intervenor's proposed revisions to CECo's Proposed Supplemental Initial Decision, paragraph 104) since they are merely a summation of other factual findings which we believe to be erroneous and to which we have specifically replied.

To facilitate the Licensing Board's decisionmaking process, the reply findings are separately identified by reference to the Intervenor's findings to which they reply and are designated by the prefix "R." The Licensing Board should accept Intervenor's views as consonant with those

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set forth in Applicants' proposed decision in the paragraphs of CECo's Proposed Supplemental Initial Decision where text was either adopted by Intervenors or their editorial revisions have no substantive impact.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 2B

R-2B. Intervenor's mischaracterize the nature of the issues remanded by the Atomic Safety and Licensing Appeal Board ("Appeal Board") in ALAB-770. Intervenor's suggest that the entire issue of the construction adequacy at Byron was remanded by the Appeal Board and it was only within a "full exploration" of construction adequacy that attention was to be focused on Hatfield and Hunter. The Appeal Board (ALAB-770, p. 27) did state that the Byron Reinspection Program should be explored "in terms of whether there is currently reasonable assurance that the Byron facility has been properly constructed." In the sentence following this quotation, the Appeal Board carefully and clearly stated that the construction adequacy at Byron was to be considered on remand solely within the context of the qualifications of Hatfield and Hunter quality control inspectors and the work performed by those two contractors.^{*/} The suggestion in Intervenor's Paragraph 2b that the scope of the Appeal Board's remand order involved work quality issues under the Byron Reinspection Program other than that of Hatfield and Hunter is erroneous and should be disregarded by the Licensing Board.

^{*/} The adequacy of the equipment supplied by Systems Control Corporation ("SCC") was also a matter remanded by the Appeal Board; however, the qualifications of SCC quality control inspections was not tested by the Byron Reinspection Program since the Program only included contractors who unlike SCC performed work at the construction site.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPHS 26A-26C

R-26A-26C. Intervenors assert that Applicant failed to apply adequate expertise in the development of the Byron Reinspection Program. In particular, they point to the alleged inexperience of Mr. Del George, his lack of expertise as a statistician and the lack of precedent from other "reinspection programs" to support certain assumptions used in the Byron Reinspection Program. Intervenors do not fairly characterize the record. Contrary to their arguments, the Byron Reinspection Program was developed by a number of people all of whom provided the expertise necessary to structure a comprehensive and adequate program.

Intervenors stress in Paragraph 26A that Mr. Del George's assignment as lead-manager of the Byron Reinspection Program was his first such assignment--the implication being that the formulation of this important program was improperly entrusted to a "rookie." This interpretation ignores the fact that Mr. Del George had substantial experience relevant to the management of a program like the Byron Reinspection Program. He managed a number of backfit projects at the Dresden and Quad Cities Stations involving structural, electrical and mechanical construction activities. (Del George, prepared testimony, at 3, ff. Tr. 8406.) Mr. Del George participated in corrective action programs involving

reinspection work under the ASME and AWS Codes at Applicant's LaSalle County Station. (Del George, prepared testimony at 3-4, ff. Tr. 8406; Tr. 8467-68). Mr. Del George's experience at LaSalle included reinspection of the installation of structural steel, mechanical systems supports and piping and a reinspection plan involving bolt torquing. (Del George, Tr. 8468.) The fact that these programs involved work quality objectives does not detract from their relevance as building blocks of substantial experience that held Mr. Del George in good stead in discharging his function as the manager responsible for managing the development of the Byron Reinspection Program.

More importantly, Intervenors incorrectly characterize Mr. Del George's role as though he was solely responsible for the Program's development. In fact, he was only one of three individuals who played a central role in the development of the Byron Reinspection Program. The Project Construction Department, represented by Mr. Tuetkin, provided insight as to the nature of the site contractors' activities. The Applicant's Quality Assurance Department, represented by Mr. Shewski, provided assistance in shaping the Program by providing guidelines for Program groundrules and mechanisms to assure adequate oversight during implementation of the Program. (Del George, prepared testimony at 5, ff. Tr. 8406; Tr. 8470-71.) Additionally, NRC Region III Staff participated

in development of the Byron Reinspection Program. The NRC resident inspector, Mr. Forney, added 2 to 4 inspectors to the roster of inspectors who were candidates for reinspection. (Del George, prepared testimony at 11, ff. Tr. 8406; Forney, Tr. 10,078-79.) It was at Mr. Forney's suggestion that the first inspector listed on each site contractor's roster was included in the Program. (Forney, Tr. 10,777.) Finally, his recommendation was adopted expanding the reinspection period from 30 to 90 days. (Forney, Tr. 10,079.) Thus, it is readily apparent that the Byron Reinspection Program was the product of the combined efforts of the Applicant and NRC Region III; not as suggested by Intervenors, the work of a solitary individual.

Intervenors' attack on Mr. Del George's lack of expertise in statistics is of no consequence since mathematical statistical theory was not a basis for formulating the Program. Furthermore, it is not surprising that many of the sampling elements and acceptance criteria used in the Program had never been applied in reinspection programs for other plants since we previously observed that this Program was unusual in testing the qualifications of quality control inspectors. (I.D. ¶ D-416.) Compare Shoreham (adequacy of construction); Diablo Canyon (adequacy of design).)*/

*/ Long Island Lighting Company (Shoreham Nuclear Power Station, Unit 1), LBP-83-57, 18 NRC 445 (1983); Pacific Gas and Electric Co. (Diablo Canyon Nuclear Power Plant Units 1 and 2), ALAB-763, 19 NRC 571, 582 (1984).

In sum, Applicant brought to bear individuals with adequate expertise who applied their knowledge to structure a proper reinspection program for the Byron Station.

REPLY TO INTERVENORS PROPOSED
PARAGRAPH 32

Intervenors suggest that Applicant had the burden of establishing that inspectors who performed fewer than the minimum number of inspections (50 for Hatfield and Hunter and 25 for PTL) were "as likely to perform as well as inspectors who stayed on the job longer." A comparison of the performance record of QC inspectors based on length of service is irrelevant to the question of whether these inspectors were adequately trained to qualify for the job. In any event, there was no need to reinspect the group of inspectors identified by Intervenors because, as they admitted, a 100% reinspection effort was unnecessary. (Intervenors' Proposed Decision, paragraph 30.) The results of the inspectors sampled under the Byron Reinspection Program provided the basis for inferring that the population of inspectors not captured by the Byron Reinspection Program, including those inspectors who had less than 50 or 25 inspections, were also qualified.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 34A

R-34A. Intervenor suggest that the results of the reinspection program demonstrate that the addition of inspectors to the sample of inspectors whose work was reinspected by the NRC Staff was nonconservative. It would, of course, have required an unerring ability to predict the future to select, in advance, those inspectors who would score the lowest in the reinspection program. Contrary to Intervenor's assertion, Mr. Forney described the basis on which he selected inspectors to be added to the reinspection program as follows:

Q. Mr. Forney, how did you select the inspectors which were added to the random sampling for inspectors at Hatfield? You selected four of them from what I recall in your testimony.

A. Yes, I did. I reviewed records of a number of Hatfield inspectors of whom I felt were at least marginally experienced, so I wanted to see how they would come out.

(Forney, Tr. 7994.)

This was clearly a rational basis on which to add inspectors whose qualifications were deemed suspect to the reinspection program. Given Mr. Forney's status as an NRC employee and his apparent continuing skepticism about the qualifications of quality control inspectors at Byron (See finding R-99, infra), the Licensing Board should reject any hint that he deliberately selected inspectors who were likely to score well in the reinspection program.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 35

R-35. Intervenor's assert that there is no basis for the "engineering judgment" which underlies both the adequacy of the sample of inspectors for drawing conclusions concerning the qualifications of those inspectors not captured by the reinspection program and the basis for concluding that inaccessible and not-recreatable inspections are adequate. We deal here with the engineering judgment in question.

The Licensing Board is referred to Applicant's original proposed findings 30 and 37 which analyze the basis for the adequacy of the sample of inspectors. It should be noted in addition that the adequacy of the sample of inspectors was validated after the reinspection program was completed by reference to Military Standard 105-D ("Sampling Procedures and Tables for Inspection by Attributes," Washington, D.C. U.S. Government Printing Office 1963). (Del George, prepared testimony at 14, ff. Tr. 8406; Del George, Tr. 8699-8700.) That standard is a standard ANSI document containing sample plans which specify sample size as a function of population size. For each of the contractors the number of inspectors reinspected equals or exceeds those which would be specified under Military Standard 105-D for a single sampling plan at a normal inspection level. (Del George prepared testimony at 14-15, ff. Tr. 8406, See also Reply Finding R-34A, supra.)

The controversy over the basis for the adequacy of the inspector sample is placed in proper perspective when it is recognized that the qualifications of those inspectors not captured by the reinspection program were validated by the following syllogism. The Byron Reinspection Program was a response to NRC item of noncompliance 82-05-19 which found that the programs of site contractors for qualifying quality control inspectors were inadequate and not in accordance with ANSI N 45.2.6. Thus, CECO was compelled to assume, before the Byron Reinspection Program began, that the programs for qualifying quality control inspectors were inadequate and that, as a result, individual inspectors may have been unqualified in the period prior to September, 1982. (Del George Tr. 8796.) As explained by Mr. Del George, it was assumed at the inception of the program that if the results demonstrated the qualification of the sampled inspectors, the effectiveness of the inspector qualification programs had been shown and an inference that the unsampled population of inspectors was also qualified could be drawn. (Del George, Tr. 8794; 8796-97.) That assumption was validated by the results of the program which showed that the sampled inspectors were, in fact qualified to the acceptance criteria for the BRP. (Ibid).

Similarly, it was assumed that inaccessible and not-recreatable inspections were sufficiently similar to the reinspected work so that the results of the program for

reinspected attributes were transferable. (Del George Tr. 8795.) This assumption was also validated, both by a review of the inspection procedures for inaccessible and not-recreatable work and the good results of the reinspection program itself that, among other things, determined that the qualification and certification procedures in place prior to September, 1982 were effective. (Del George Tr. 8796-97.) These assumptions were in fact the engineering judgments which underlay the design of the reinspection program. (Del George Tr. 8877.)

The above bases for CECO's engineering judgment in selecting the sample of inspectors and determining the adequacy of the inaccessible and not recreatable inspections are in sharp contrast to the apparently nonspecific and unexplained use of engineering judgment in the Comanche Peak case (Texas Utilities Generating Co. (Comanche Peak Steam Electric Station Units 1 and 2), LBP-83-81, 18 NRC 1410, 1420 (1983)). There the Licensing Board criticized the applicant and the Staff for urging it to accept engineering judgment "without any explanation." The evidence before us, however, contains just the explanations of engineering judgment which were lacking in Comanche Peak. Indeed, the Comanche Peak Licensing Board recognized that "reasoned explanation" supporting conclusions regarding the safety of systems at issue in that proceeding would provide a satisfactory

basis for resolving issues before it. (18 NRC at 1420.)

Finally, it should be noted that Dr. Singh never addressed the adequacy of the sample of inspectors in his prepared testimony (See Singh, Tr. 9067-68.) Moreover, as discussed in paragraphs 180 and 181 of Applicant's Proposed Decision, Dr. Singh's use of statistics with respect to work quality was appropriate.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 36

R-36. Intervenor are apparently unaware of the record evidence which describes the basis on which the NRC Staff added inspectors to the reinspection program. (See Finding R-34A, supra.) The basis on which inspectors having less than the minimum number of inspections were excluded from the program was described in Mr. Del George's direct testimony. While, those inspectors, some of whom had as few as 7 inspections were not included in the inspector sample, the results of reinspections of their work was included in the program data base for determining the existence of design significant discrepancies. (Del Goerge, prepared testimony at 16-17, Attachment E at 7, ff. Tr. 8406.) The remaining major assumptions on which CECO based its approach to the reinspection program were also clearly articulated on the record. (See Del George, Tr. 8787-8801.)

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 37

R-37. The citation to Dr. Frankel's testimony at Tr. 11,137 does not relate directly to the adequacy of inspector sampling, but rather to the similarity of various Hunter inspection elements. (See Frankel, Tr. 11,134-36.) To the extent Dr. Frankel's testimony can be regarded as having general applicability, he made clear that in the type of survey sampling work with which he was familiar the statistician does not routinely perform statistical tests to determine the appropriateness of aggregation of elements, but rather defers to the subject matter expert. (Frankel, Tr. 11,137, See also Reply Finding R-34A, supra.)

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 38A

R-38A. Dr. Ericksen correctly cites The Byron Reinspection Program Report (Applicant's Exhibit R-4) for the proposition that if a QC inspector could not be identified unequivocally as the original inspector of a Hatfield-produced weld, that weld or inspection activity was not included in the Program. However, Intervenor, in Paragraph 38A, then incorrectly infer from the Ericksen testimony that the welders who produced these welds could not be identified due to inadequate records and that this alleged circumstance places the quality of those welds into question. Nothing in Dr. Erickson's testimony or in the BRP Report cited by him remotely suggests that there was any issue concerning welder identification or qualification which was addressed by the BRP. Indeed, the matter was irrelevant to the Program since the objective was to match up the original QC inspector with his original inspection activity so that they both could be reinspected. For these reasons, the statement in Intervenor's Paragraph 38A concerning a "nonconservative bias" should be disregarded as lacking basis in fact. It should be noted that those welds for which no inspector could be identified or for which inspection records were otherwise incomplete were subject to a further inspection as a result of a CECO quality assurance audit finding. (Shewski, prepared testimony at Attachment Q, ff. Tr. 8423.)

REPLY TO INTERVENORS' PROPOSED
PARAGRAPHS 41-49B

R-41-49B. Applicant and Intervenors have both presented proposed findings which deal with the weight to be attached to Dr. Kochhar's criticisms of the use of the first 90 days of each inspector's work for reinspection purposes. The sufficiency of Dr. Kochhar's work experience, human factors experiments of 2 or 3 hour duration.^{*/} and theoretical ruminations as a basis for our findings have been fully presented by CECO and Intervenors. However, one point rises above the conflicting views of Dr. Kochhar's testimony and the weight to be accorded to it, namely that the Kochhar thesis assumes that the training and qualification of inspectors to be reinspected are not in question. Indeed his major criticism of the selection of the first 90-day period is that such training is sufficient to forestall initially the onset of monotony and boredom. Thus, Dr. Kochhar concludes that any reinspection must be performed over the time of the inspector's job performance to allow the effects of early enthusiasm to be offset by the later effects of monotony and boredom.

^{*/} Applicant and Intervenors refer to Dr. Kochhar's experiments as lasting two or three days. (Applicant's Proposed Decision, Paragraph 47; and Intervenors' Proposed Decision, Paragraph 47.) As indicated at Tr. 10,558, Dr. Kochhar testified to a two or three-hour duration period. However, during questioning by the Licensing Board, Dr. Kochhar agreed with Dr. Cole's two or three-day characterization. (Tr. 10,595-596.) Although the record is confused, Applicant's argument that the duration of the Kochhar experiments are too short to be meaningful is unchanged, regardless of whether two or three hours or days is used.

Dr. Kochhar's thesis may be valid in a general sense but it is irrelevant to the issue at hand. For as Dr. Kochhar admitted (Tr. 10,571), it was necessary to reinspect a Byron QC inspectors' early work before the effects of on-the-job training masked any lack of adequate training. Obviously, the first weeks of an inspector's performance was the proper target for reinspection under the Byron Program. Ninety days was a sufficient period of time for reinspection -- long enough to provide reliable information showing the trend of inspector performance, but not too long to mask any training shortcomings. (Applicant's Proposed Decision, Paragraph 41.) This point is conceded in Paragraph 49B of Intervenors' Proposed Decision.

Intervenors also argue in Paragraph 49B that the use of the first 90 days was nonconservative for purposes of making "generalizations concerning the levels of inspector performances over time at Byron." This point is a nonsequitur since the issue of inspector performance over time was neither an objective of the Byron Reinspection Program nor an issue in this proceeding. Intervenors also urge that the results of the first 90 days of inspection is nonconservative for purposes of drawing work quality inferences. Neither Dr. Kochhar nor any other witness supported this notion. This is perhaps the reason that Intervenors provide no supporting citation to the record. Both of these conclusions should be rejected.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 54

R-54. Intervenors' attack Mr. Hansel's use of the Harris and Chaney data measuring defect detection rates among inspectors. They object to the data being used to support the efficacy of a 90% acceptance criterion established to determine agreement rates between inspectors with respect to the inspection of subjective attributes. The criticism is misplaced because the Harris and Chaney data indicating that an inspector will only detect 20 to 80% of the defects on an item of equipment depending on its complexity indicates a substantial likelihood for differing results among inspectors, i.e., each inspector will detect some defects not found by others. The application of this data to support the 90% criterion can only be questioned if one assumes the incredible, namely, that the inspectors who participated in the Harris and Chaney experiments only detected the same defects during their inspections. Thus, it was reasonable for Mr. Hansel to use the Chaney and Harris data as one basis to validate the 90% acceptance criterion for the inspection of subjective attributes under the Byron Reinspection Program. In any event, the issue is academic in view of the Intervenors' acceptance of the 90% criterion in their Paragraph 54.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 65

R-65. Mr. Hansel found no evidence of a buddy system whereby a reinspector might alter his inspection results because of a personal friendship with the original inspector. Indeed, Mr. Hansel testified that there were a number of countervailing reasons why a reinspector would not be motivated to improperly favor an original inspector. (Applicant's Proposed Decision, Paragraph 65.) Intervenors believe that Mr. Hansel's views are entitled to no weight because he failed to interview any reinspectors directly.

As Hansel stated, interviews with reinspectors would serve little purpose because they would not be forthcoming. (Hansel, Tr. 9021.) Common sense supports this judgment. The notion that a reinspector would "confess" during an interview that he had favored his buddy inspector is naive. Moreover, Intervenors' argument ignores the fact that the NRC Region III also found no evidence of the buddy system being employed under the Byron Reinspection Program. (Tr. 9856-57.)

Finally, the "buddy system" issue is a red herring because the uncontroverted testimony of Mr. Hansel is that such a system could not work effectively as a result of employee turnover and protective measures employed during the Program. Only one of the original Hatfield QC inspectors

was still employed at the time of the Byron Reinspection Program. (Hansel, Tr. 8926-27.) Moreover, a Hatfield QC inspector still employed at the Byron Station recorded the lowest agreement rate for subjective attributes in the BRP and a QC inspector who had left the Byron site in July, 1981 had one of the highest agreement rates for objective attributes. (Buchanan, prepared testimony, Attachment C, ff. Tr. 11,174.) Thus, the buddy system was apparently ineffective at Hatfield. In the case of Hunter, the identity of the original QC inspectors captured in the Program was masked by the use of identifying numbers rather than by name. (Hansel, Tr. 8927.) PTL's reinspectors came from work locations at sites other than Byron, thereby minimizing the likelihood that a reinspector might be personally acquainted with one of the original QC inspectors. (Hansel, Tr. 8927.)

Mr. Hansel's views were consistent with the results of the special unit concept inspection performed by PTL inspectors on behalf of the Applicant. These inspectors, who had no apparent connection with Hatfield and Hunter employees, were able to reproduce the results of Hatfield and Hunter reinspectors without difficulty. Clearly if the favoritism suggested by Intervenor were present, it would have been found by the PTL inspectors during the performance of the unit concept inspections. (Applicant's Proposed Decision, Paragraph 69.)

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 68

R-68. Intervenor suggest that results of inspections performed by PTL inspectors are tainted because PTL had a "cumulative average of 85.3% for all its inspectors whose subjective work was reinspected, and 77% for its inspectors who were reinspected in the expanded sample period." These percentages, so Intervenor's argument goes, are below the 90% acceptance criterion for subjective attributes, and hence the PTL inspectors were less than fully qualified. This argument is without merit since it is based on the improper use of the statistics.

The Byron Reinspection Program in the first instance was structured to determine the qualification of individual inspectors. Thus, the 90% and 95% acceptance criteria were applied on an inspector-by-inspector basis to determine individual competence. Inferences were then drawn with respect to the total population after the qualification of the sampled inspectors was individually determined. (Applicant's Proposed Decision, Paragraphs 50-54.)

As explained by Mr. Del George, the averages computed by Intervenor are meaningless. (Del George, Tr. 8506-09.) In the case of PTL, the calculated averages below 90% reflect the results of two inspectors who did not pass the acceptance criteria established under the Program.

In this circumstance, all of the inspectors' work was reinspected, thereby removing any doubt concerning the adequacy of their work. More importantly, the reinspection activity for PTL was expanded to other inspectors who inspected the same type of work to assure that the failed inspectors represented a unique circumstances rather than a trend. (Applicant's Proposed Decision, Paragraphs 55-56.)

Finally, Intervenors' reliance on the average agreement rates for PTL inspectors subject to the BRP is irrelevant to the validity of the special unit concept inspection. As described by Mr. Shewski, the special unit concept inspection was conducted by five PTL inspectors who were qualified and certified to the requirements of ANSI N 45.2.6. (Shewski, prepared testimony at 20, ff. Tr. 8423.)

REPLY TO INTERVENORS' PROPOSED
PARAGRAPHS 70-76A

R-70-76A. Intervenors argue that three factors advanced in Dr. Kochhar's testimony undermine confidence in the results of the Byron Reinspection Program. Specifically, they urge that the results were improperly biased because (i) of reliance on the first 90 days of inspector's job performance, (ii) the reinspectors knew the names of the original inspectors, and (iii) the reinspectors, in most cases, knew the original inspection results. A fair reading of Dr. Kochhar's testimony leads to only one conclusion, namely, that he has failed to raise a scintilla of doubt with respect to the objectivity of the results of the Byron Reinspection Program. The biases his theories hypothesize and their effects are not demonstrable by any objective criterion.

Dr. Kochhar's position on the first 90 days is disposed of supra in Paragraphs R-41-49B. The assertion of bias due to the reinspector knowing the identity of the original inspector is addressed supra in Paragraph R-65. In addition, it should be noted that in response to a Licensing Board's question, Dr. Kochhar stated that the auto and small parts industries mitigate the effects of inspector tedium by reassigning the inspectors to other responsibilities in the plant. (Kochhar, Tr. 10,602-603.) Thereafter, Dr. Kochhar

admitted that the commingling of inspectors with other workers could affect the impartiality of inspectors when they return to that duty. (Kochhar, Tr. 10,608-609.) Dr. Kochhar also admitted that the auto and small parts industries had never viewed the potential of impartiality among inspectors because of commingling with the general work force as a serious problem. (Kochhar, Tr. 10-609-610.) Nevertheless, Dr. Kochhar disregarded actual industry experience and continued to persist in the notion that the effect of the bias should be considered. (Kochhar, Tr. 10,610-611.)

On the issue of bias due to the so-called "mimic" effect, Dr. Kochhar has not quantified its effect on the Byron Reinspection Program. However, he agreed that the effect would be offset by the tendency of the reinspectors to overcall weld discrepancies, i.e., generally categorize borderline welds as discrepant rather than acceptable. (Kochhar, Tr. 10,624-625). The mimic effect would also be offset by the tendency of inspectors generally to justify their existence by finding discrepancies (Kochhar, Tr. 10,625-626), and the tendency of inspectors to exercise more care when inspecting safety-related equipment. (Kochhar, Tr. 10,626.) In sum, it is impossible on this record either to ascertain the impact, if any, of the mimic effect on the results of the Byron Reinspection Program, or to determine

the impact of the offsetting phenomena indicated above. In this circumstance, the Licensing Board can conclude only that Dr. Kochhar's testimony on mimic effect is without probative value.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 99

R-99. Intervenor's proposed paragraph 99 begins with a reference to material which, although received in evidence, was to be expressly limited to the scope of the remanded hearing, the results of the reinspection program for Hatfield, Hunter and PTL. The "Byron Reinspection Program Report" referred to was introduced into evidence as Applicant's Exhibit R-4 with the understanding of all parties and the Board that only those portions of Applicant's Exhibit R-4 actually referred to by witnesses could be used as a basis for findings. (Tr. 11,146.) The statistics found in the second and third paragraphs of Intervenor's Proposed Paragraph 99 are not limited to Hatfield, Hunter and PTL, but address the results of the reinspection program for all contractors. (Applicant Exhibit R-4, Exhibit V-2.) Accordingly, these statistics should be disregarded.

For the three contractors who were the subject of this remanded proceeding 68 inspectors were subject to the reinspection program (23 for Hatfield, 22 for Hunter and 23 for PTL) and only 1 PTL inspector did not meet the threshold of acceptable performance after six months of his inspections were-reinspected. (Del George, prepared testimony, Attachment C, ff. Tr. 8406.) In addition, the results for one Hunter inspector, one Hatfield inspector and two PTL inspectors

were regarded as indeterminate in that they failed to meet the acceptance criterion for visual welding after 90 days and had no inspections thereafter. (Applicant Exhibit R-4, Table V-2.) For PTL, the fact that one inspector failed to meet the acceptance criterion for visual welding after six months led to a reinspection of all visual weld inspectors. (Del George, prepared testimony at 28, ff. Tr. 8406.)

Accordingly, for the contractors which are within the scope of this proceeding, the Byron Reinspection Program does establish the qualifications of inspectors and the presumption that they uncovered defects of possible safety significance has not been rebutted. For Hatfield and Hunter, less than 5% of the sampled inspectors were shown to not meet program acceptance criteria in that their qualifications were deemed indeterminate. For PTL, the percentage of inspectors not meeting program acceptance criteria is higher, but all PTL inspectors performing visual weld inspections were reinspected, thus removing the issue of their qualification from the realm of inference to that of demonstrated capability.

Intervenors proposed paragraph 99 also selectively quotes from the testimony of Mr. Hayes as supporting the proposition that inspector capabilities could not be inferred from the results of the Byron Reinspection Program. Mr. Hayes was quite straightforward in stating that the views he

set forth in a memorandum asserting that the BRP "tells us little about the capability and effectiveness of the selected inspectors" were not actually held by him at the time he prepared the memo or when he testified. (Hayes, Tr. 10,050.) Mr. Hayes further explained his position in response to Board questions at Tr. 10,053-058, indicating that at the time he prepared the memorandum, he did not feel that the Byron Reinspection Program conclusively established that the inspectors were qualified (Hayes, Tr. 10,054) and that his memorandum was written to provoke discussion. (Hayes, Tr. 10,056.) Mr. Hayes ultimately stated that the testimony of Mr. Little summarized what the NRC Staff believed the Byron Reinspection Program accomplished. (Hayes, Tr. 10,121.) As noted in Commonwealth Edison Company's Proposed Decision, paragraph 102, Mr. Little stated that the results of the program demonstrated inspector capability.

Intervenors' proposed paragraph 99 is based principally on the testimony of Mr. Forney. Mr. Forney was the senior resident inspector at Byron when the Byron Reinspection Program was formulated and made many suggestions about the reinspection program that Commonwealth Edison Company proposed, all of which were accepted. (Forney, Tr. 10,077-078.) Apparently he never made any suggestions for changes in the program which would have met his current criticisms of the BRP. Mr. Forney's testimony is confusing since he now

disagrees with his own statement of the purpose of the BRP in the hearings conducted in August, 1983 (Compare Tr. 7991 with Tr. 10,083) nor does he agree with the statement of the purpose of the BRP found either in our initial decision (Tr. 10,090) or ALAB-770. (Tr. 10,091-92.) Accordingly, and because he had no specific responsibilities with respect to the Byron Reinspection Program after July, 1983, we give little weight to his testimony. (Forney, Tr. 10,075.) However, a careful reading of Mr. Forney's testimony indicates that his differences with the NRC Staff position are truly "miniscule", even if one just considers the results of the Byron Reinspection Program in terms of a demonstration of inspector qualification.

Mr. Forney stated that the results of the Byron Reinspection Program alone do not conclusively demonstrate that an inspector is capable. (Forney, Tr. 10,063.) Before a conclusive statement regarding qualification of inspectors could be made, Mr. Forney would have wanted to know if the inspector whose work was being reinspected had detected defects in his original inspections. This was necessary to avoid the possibility that the inspector originally passed all work, but that the work was of sufficiently high quality so that the reinspection agreement rate merely validated the quality of the work at an acceptance level which met Byron

Reinspection Program acceptance criteria of 90% and 95%.

(Forney, Tr. 10,065-66.) Mr. Forney readily agreed, however, that the results of the BRP provided assurance that prior to September, 1982, quality control inspectors were capable of identifying significant, safety-related hardware problems.

(Forney, Tr. 10,099.) Mr. Forney also agreed that an ability to discern acceptable work revealed something about an inspector's qualifications so that even if work quality were initially very high inspectors were sufficiently qualified so as not to reject work performed in accordance with requirements.

(Forney, Tr. 10,067.) Moreover, Mr. Forney was aware of a number of Hatfield, Hunter and PTL nonconformance reports which documented discrepant conditions at Byron Station.

(Forney, Tr. 10,112.) If inspectors had been doing a poor job and craftspeople a superior job, he would not have expected to find very many discrepancy and nonconformance report issued. (Forney, Tr. 10,112.) Ultimately, Mr.

Forney agreed that a 14% reject rate for first time inspections was reasonable, that is, that workers made errors about 14% of the time. (Forney, Tr. 10,112.) This was substantiated by two Commonwealth Edison Company quality assurance surveillances which documented an approximate 14% reject rate for two aspects of Hatfield cable pan hanger work when it was initially inspected. (Shewski, prepared testimony, Attachments Q and

R, ff. Tr. 8423.) Since the Byron Reinspection Program acceptance criteria were set at 90% and 95% for subjective and objective inspection respectively, an agreement rate for inspectors in the Byron Reinspection Program at or above those rates demonstrated, even to Mr. Forney, that the inspectors were qualified in finding problems when they originally inspected a crafts-person's work. (Forney, Tr. 10,112-13.)

After evaluating Mr. Forney's testimony as a whole, we agree that his differences with the NRC Staff position are miniscule. His testimony does not detract in any significant fashion from the preponderance of the evidence which establishes that quality control inspectors at Byron prior to September, 1982 were qualified and thus may be presumed to have detected safety significance deficiencies. Indeed, not one witness has even disputed the qualifications of inspectors to detect safety significant deficiencies and it is that type of deficiency which has been the focus of our concern.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 112

R-112. Of the total of 1713 evaluations of discrepant conditions observed on Hatfield objective attributes, 1244 evaluations determined the "discrepancy" to be within current design parameters and tolerances. Applicant concludes that these so-called discrepancies were not valid because the reinspection criterion was more stringent than that established for the original inspectors. Intervenors appear to accept this point; however, they also argue that uncertainty exists because it is not clear how many of the discrepancies covered by the 1244 should have been detected by original inspectors. Since the "discrepant condition" did not exist at the time of the original inspection, the answer to Intervenors' query is "none."

Intervenors' characterization of this matter and in Paragraph 122 should be rejected.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 116

R-116. Intervenor urge that the supplemental reinspection program was established because of shortcomings in the original report which were identified by the NRC Region III Staff and others. This statement is incorrect. The supplemental program was initiated to provide further information requested by the Region III Staff. Tuetken, prepared testimony at 31, ff. Tr. 8406. In addition, the supplemental program provided additional data to permit a complete work quality assessment. (French, prepared testimony at 9, ff. Tr. 9044.) The need for this additional information is not surprising in view of the fact that the original thrust of the Program was to determine inspector qualifications.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 118

R-118. Intervenor's quarrel with the discussion in the footnote to Paragraph 118 concerning the design significance of one Hatfield discrepancy. As explained in the footnote, the discrepancy was properly evaluated as lacking in design significance. Intervenor's disagree based on their perception of "the history of manual operations in operating plants such as TMI and the imperfect nature of any testing system." Intervenor's cite no record basis to support their position. None can be cited because no record support exists. Intervenor's' position as stated in Paragraph 118 and referenced in Paragraph 126 should be rejected.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 129

R-129. Intervenors cite Mr. McLaughlin (Tr. 9142) as stating that some highly stressed welds captured in the Byron Reinspection Program were not evaluated by Sargent & Lundy. That transcript reference does not support Intervenors' proposed finding. At Tr. 9150-51, Mr. McLaughlin describes the population of highly stressed welds which were evaluated by Sargent & Lundy in the Byron Reinspection Program. While it is not clear from the testimony whether there were additional highly stressed welds captured by the BRP which were not evaluated by Sargent & Lundy, Applicant's Exhibit R-5 at page SII-1 indicates that all such welds were in fact evaluated.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 131

R-131. The addition supplied by Intervenors to Paragraph 131 is not substantive. However, to be accurate, should read:

"including strength reductions of up to 90% for welds without cracks. (McLaughlin, Tr. 9160) Three welds had cracks and for purposes of evaluation were assumed to have a 100% strength reduction. (McLaughlin, Tr. 9162-9163.)"

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 132A

R-132A. Intervenor misperceive the evaluation approach used by Sargent & Lundy with respect to inspecting so-called "neighboring welds" under the Byron Reinspection Program. If discrepant weld was identified during the Program, the inspection activity was expanded to include all welds on the connection containing the discrepant welds. (McLaughlin, Tr. 9155.) Inspection of welds on neighboring connections was not undertaken under the Program unless the Sargent & Lundy evaluation relied upon such a connection to share the load that was recalculated for a connection containing a discrepant weld. (Erler, prepared rebuttal testimony at 5-6, ff. Tr. 11,158.) Mr. Kostal carried his evaluation of SCC discrepant welds beyond that necessary for the Byron Program. For example, all connections and their welds were inspected in instances where Mr. Kostal wished to establish the existence of redundant load paths. (Tr. 10,234-238.) This activity was unnecessary but it was ordered by Mr. Kostal because of his desire to answer any conceivable question during cross-examination. (Tr. 10,238-240.)

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 159

R-159 Intervenor's assert that because design is not an issue in this proceeding, the Licensing Board can make no findings with respect to conservative loadings, assumptions or margin used in the Byron design. Although the adequacy of the general design of the Byron plant was not an issue, the Sargent & Lundy discrepancy evaluations clearly do fall under the ambit of the remanded proceeding. Sargent & Lundy's evaluation necessarily considered loadings, assumptions and margins used in the design. And, as noted by the Licensing Board, the issue of design criteria is relevant to the extent that the criteria are used in the evaluation of the discrepancies noted in the BRP. (Tr. 10,668, 10,687.) Thus, to the extent that these factors were used in the Sargent & Lundy evaluations, evidence on loadings, assumptions and margins was properly received into evidence, and findings based upon that evidence may be made. Accordingly, the Board may properly find that the un rebutted evidence on loadings, assumptions and design presented by Mr. McLaughlin and Mr. Laney lend support to their conclusion on the adequacy of the Hatfield and Hunter work. Intervenor's contrary assertion in their proposed paragraph 159 as well as Paragraphs 168 and 170 should be disregarded.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPHS 166-166E

R-166-166E. Intervenors reiterate several positions in these paragraphs that have been addressed previously in this Reply. For example, Intervenors' proposed paragraph 166 mischaracterizes the scope of this remanded proceeding. This matter is discussed supra in Paragraph R-2B. Similar references will be made as appropriate to other paragraphs in the 166 series. Only new matters will be addressed in any detail.

Intervenors' first basis for disputing Applicant's conclusion on work quality is their allegation that there has been no showing of inspector qualification from which work quality can be inferred. Specifically, they state that, based on the testimony of Messrs. Forney and Hayes, one cannot reasonably infer from the BRP results that quality control inspectors at Byron prior to March, 1983 were qualified. As has been discussed in our reply finding R-99 supra, the testimony of Messrs. Forney and Hayes does not cast doubt on the conclusions that can be drawn from the reinspection program regarding inspector qualifications. Further, Intervenors do not dispute an inference of adequate work quality if it is established that inspectors were, indeed, qualified.

Intervenors' reliance on the Kochhar and Ericksen criticisms in paragraph 166b have been addressed supra in R-

41-49B and infra R-178A-184A respectively. Intervenors also suggest that the inadequacy of the reinspection program to support an inference of work quality is confirmed by the fact that Mr. Laney had to rely on other bases to support his conclusion that the quality of Hatfield and Hunter work was acceptable. All of Applicant's work quality witnesses used multiple bases for their conclusions on the adequacy of the Hunter and Hatfield. As a conscientious and responsible expert witness, Mr. Laney felt obligated to go beyond the documents which reported the results of the BRP. Those further investigations are described in Mr. Laney's prepared testimony and are the basis for his overall judgment. (Compare, Laney, prepared testimony at pp. 9-10, ff. Tr. 9339 with Laney, Tr. 9379-80.)

In paragraph 166-C, Intervenors attack the use of the Applicant's QA program to buttress work quality judgments. The criticism of PTL's inspector performance has been addressed supra in R-68, and it will not be repeated here. The episode of the alleged PTL attempt to override the third party review does not, as suggested by Intervenors, reflect adversely on the reliability of PTL. PTL was not attempting to alter the results of the Program, rather its action is attributable to misunderstanding due to a lack of communication among Applicant, Sargent & Lundy and PTL. (Tr. 9316-17.) Moreover, this issue was discovered by CECO Quality Assurance

in one of its audits and corrected by PTL as a result. (Shewski, prepared testimony, p. 15; Attachment O, ff. Tr. 8423.)

Finally, Intervenors suggest that two extraneous issues involving Systems Control Corporation ("SCC") cast doubt on the validity of the inference of acceptable work quality at Byron from the results of the BRP. First, Intervenors suggest that CECO's supervision of SCC at Byron casts doubt on the overall adequacy of CECO's quality assurance program. The effectiveness of SCC's quality assurance program and CECO's oversight of SCC was litigated in the initial hearings on quality assurance. We found that SCC's quality assurance program was "fraudulent" and that CECO defaulted in its oversight responsibility of that vendor (I.D. -D-442). That issue was not remanded by the Appeal Board and its relitigation in the remanded proceeding was not suggested by any party. What was before us in the remanded proceeding was the efficacy of the 100% source inspection of SCC equipment to which we also referred in our initial decision. We learned that CECO had inadvertently not met all of its commitments to conduct such inspections, but that subsequent reinspections and analyses demonstrated the adequacy of that equipment. (See Commonwealth Edison Company's Proposed Initial Decision paragraph 204-264.)

Intervenors do not challenge those conclusions in their proposed findings. It is clear that SCC was not a site contractor at Byron; that it was not subject to the reinspection program; and that the effectiveness of CECo's quality assurance programs for site contractors is not significantly diminished by its lack of oversight of SCC, an off-site vendor.

The second extraneous issue involves CECo's procurement practices with respect to SCC. We have previously ruled that procurement practices with respect to SCC are pertinent only insofar as the purchases over time bound the SCC quality assurance issue we are considering. (Tr. 10,471-77.) Accordingly, we reject any inference concerning the effectiveness of CECo's quality assurance program arising from the continued procurement of SCC equipment.

REPLY TO INTERVENORS' PROPOSED
PARAGRAPHS 178A-178B

R-178A-B. Intervenors' claim that conclusions regarding work quality are based on "bald assertions of engineering judgment" seriously misconstrues the nature of the evidence before us. Far from the "unexplained reasons" which led the Comanche Peak licensing board to criticize the use of engineering judgment (see supra, finding R-35), here both the voluminous prepared testimony and extensive cross-examination of Commonwealth Edison Company's witnesses Laney, McLaughlin, Branch, French, and Del George and Staff witnesses Little and Muffett provided clear and convincing explanations of the basis for the engineering judgments which were reached. (See e.g. Laney, prepared testimony at 10-27, ff. Tr. 9339; McLaughling, prepared testimony at 16, ff. Tr. 9047; Muffett, prepared testimony at 21-25, ff. Tr. 9510.)

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 178C

R-178C. Having misconstrued the nature of the engineering evidence before us, Intervenor also mischaracterize the nature of our interest in statistical evidence. Our initial decision questioned the adequacy of a sample of inspectors (ID-¶ D-436) and did not address at all the adequacy of the sample of work captured by the Byron Reinspection Program. Indeed, we noted on the record that the data on work quality generated by the Byron Reinspection Program was essentially a by-product of the program's results regarding inspector qualification, but that some use could be made of it. (Tr. 10,750.) Intervenor's emphasis on the results of the Byron Reinspection Program in assessing work quality is misplaced. As Mr. Del George explained, any conclusion on work quality for Hatfield, Hunter and PTL must rest on an evaluation of the results of the Byron Reinspection Program insofar as they relate to inspector qualification, the results of the Byron Reinspection Program with respect to work quality as evaluated by engineering judgment and other inspection programs at Byron. (Del George, Tr. 8804.) Moreover, the use of mathematical statistical theory to validate work quality was neither relied on by the Applicant or Staff nor is its application required by NRC regulations, as Intervenor concedes. All of Dr. Ericksen's criticisms of the use of statistics to infer work quality in

the Byron Reinspection Program were based on his analysis of observed discrepancy rates and not the more meaningful valid discrepancy or design significant discrepancy rates. (See Commonwealth Edison Company Proposed Supplemental Initial Decision, ¶180-181.) A detailed rebuttal of each point made by Dr. Ericksen is therefore not useful since his criticisms are largely irrelevant to the issues before us.

REPLY TO INTERVENORS PROPOSED
PARAGRAPHS 180-182

R-180-182. Commonwealth Edison Company rebuttal witnesses Somsag and Buchanan demonstrated the factual, engineering basis for aggregating inspection elements into two categories, subjective and objective. Dr. Ericksen's criticism of aggregation is based solely on his evaluation of the results of the Byron Reinspection Program. Yet those results are expressed in terms of observed discrepancies. Intervenors have not established that the engineering judgments which underlay the aggregation of inspection elements for Hunter and Hatfield are erroneous when the more meaningful valid or design-significant discrepancy detection rate is applied. Indeed, no quality control inspector subject to the BRP missed a design significant discrepancy, regardless of inspection element. Thus, applying Dr. Ericksen's methodology, one would apparently conclude that aggregation of inspection elements for purposes of determining the probability that design significant discrepancies exist in the portion of the plant that was not reinspected was proper.

The immateriality of Dr. Ericksen's statistical analysis is demonstrated by the change in calculated reliabilities for Hatfield visual weld examination when clustering of the sample is accounted for by calculating the design effect.

(Ericksen, Tr. 11,117.) The design effect of 40 results in the calculated reliability being reduced from greater than 99.9% to 99.5%. (Ericksen, Tr. 11,117.) Finally, Intervenors persist in their assertion that reliabilities should have been calculated at a greater than 95% confidence level "for attributes and elements that were particularly important to plant safety" citing Dr. Ericksen's prepared testimony without any specific page reference. It is disingenuous to even propose finding on this subject since Dr. Ericksen's testimony which refers to it was stricken. (See Tr. 11,026-27.)

REPLY TO INTERVENORS' PROPOSED
PARAGRAPH 184A

R-184A. Intervenors' criticism of the data underlying the BRP is misdirected. Dr. Ericksen identified only one apparent change in the data contained in the BRP report, three additional observed discrepancies attributed to the Hunter inspector identified as Inspector "A." (Ericksen, Tr. 10951.) This apparent change in the data was explained by CECo rebuttal witness Mr. De Moss who described fully the reason why the three discrepancies were initially attributed to Inspector "A" and the basis on which it was determined that these three discrepancies had been reworked, inspected by another QC inspector and therefore excluded from the BRP. (De Moss, Tr. 11,162-63; 11,165.) There were numerous changes in the data supplied by CECo, through its counsel, in response to written interrogatories propounded by Intervenors. Changes in answers to interrogatories are required by the NRC rules of practice when it is determined that the original answers are incorrect. 10 CFR § 2.740(e)(2). We specifically declined to receive an exhibit submitted by Intervenors which described the chronology of CECo's answers to interrogatories, observing that it had no probative value. (Tr. 11,115.)

The forgoing document, Commonwealth Edison Company's Reply to Intervenors' Proposed Supplemental Initial Decision, is respectfully submitted by the undersigned, attorneys for Commonwealth Edison Company.

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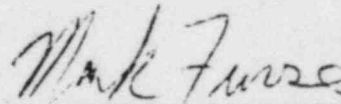
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

In The Matter of)	
)	
COMMONWEALTH EDISON COMPANY)	Docket Nost. 50-454-OL
)	50-455-OL
(Byron Nuclear Power Station,)	
Units 1 & 2))	

CERTIFICATE OF SERVICE

The undersigned, one of the attorneys for Commonwealth Edison Company, certifies that he filed the original and two copies of the attached "REPLY TO INTERVENORS' PROPOSED SUPPLEMENTAL INITIAL DECISION" with the Secretary of the Nuclear Regulatory Commission and served copies on the persons and at the addresses shown on the attached service list. Unless otherwise noted on the Service List, service on the Secretary and all parties was made by deposit in the U.S. Mail, first-class postage prepaid, this 24th day of September, 1984.



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