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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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| In the Matter of | ) | |
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| DUKE POWER COMPANY, ET AL. | ) | Docket Nos. 50-413 OL |
| | ) | 50-414 OL |
| (Catawba Nuclear Station, Units 1 and 2) | ) | |

# NRC STAFF'S PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW ON FOREMAN OVERRIDE IN THE FORM OF A SUPPLEMENTAL PARTIAL INITIAL DECISION

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October 26, 1984



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# NRC STAFF'S PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW ON FOREMAN OVERRIDE IN THE FORM OF A SUPPLEMENTAL PARTIAL INITIAL DECISION

## I. INTRODUCTION

1. At the conclusion of this Board's Partial Initial Decision (PID) of June 22, 1984, we retained jurisdiction of one, relatively narrow, aspect of Palmetto Alliance's contention that there were systematic deficiencies and pressure to approve faulty workmanship at Catawba Nuclear Station. The aspect not there resolved has come to be known as the "Welder B" foreman override issue. The Board decided all the other quality assurance questions in Applicants' favor, including the specific "foreman override" concerns which had been previously raised.

2. Nevertheless, during the course of the hearings, the NRC Staff reported allegations of a confidential source, designated as "Welder B", who raised two specific instances of foreman override regarding actions by his welding foreman which allegedly led to violation of Duke procedures governing "interpass temperature." 1/ Staff Ex. 27. As a result of further NRC inspection and activity to follow-up on Welder B's allegations,

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1/ Interpass temperature has been defined as the temperature that must not be exceeded between passes of a weld. App. Ex. 114, Attach. A, at I-5.

further information was developed and submitted for the record by the NRC Staff, which led the NRC Staff to request Applicants to initiate an extensive inquiry into these matters. See, Staff Ex. 31, P.A. Ex. 146. The Board determined that it could not resolve the matters raised on the record existing at the time of the PID, and left the record open to receive the Applicants' and the NRC Staff's follow-up reports, and to consider further action at that point. PID, at 237-238. Further, the Board conditioned its order (id., at 272) authorizing issuance of a low-power license upon:

> Demonstration to the Board of a reasonable assurance that the "Welder B" and related concerns described in III.B 48-51 do not represent a significant breakdown in quality assurance at Catawba.

3. Upon receipt of the anticipated reports, Applicants' "Investigation of Issues Raised by the NRC Staff in Inspection Reports 50-413/84-31 and 50-414/84-17", dated August 3, 1984 (App. Ex. 116), and the Staff's Inspection Report Nos. 50-413/84-88, 50-414/84-39, and an accompanying notice of violation dated August 31, 1984 (Staff Ex. 33), the Board received comments from the parties, and determined that further discovery and hearings limited to the resolution of the Welder B foreman override concerns were warranted. Record Transcript (Tr.) 12843-44. The Board noted that the scope of these further proceedings were to be limited to foreman override matters, and would not deal with miscellaneous safety concerns uncovered during Applicants' inquiry, or with foreman override concerns which related to non-safety systems.[2/]

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2/ On October 2, 1984, the Board issued a Revised Protective Order to protect the names, addresses and telephone numbers of current and former Duke employees provided to Intervenors by either Applicants or the NRC in connection with the foreman override concerns. As a result, references herein to individuals whose identity is subject to non-disclosure under the protective order are made by reference to a number code supplied by Applicants. The Board determined that disclosure even under protection of NRC confidential sources was not required in order to probe the issues herein presented. Tr. 13014-15.

Tr. 12850. The hearing took place in Charlotte, N.C. from October 9 to 13, 1984. At the conclusion of the hearing, the record was closed. Tr. 14385.

## II. STATEMENT OF THE ISSUE

4. The foreman override that we are dealing with basically involves situations where an employee is directed, either explicitly or implicitly, to violate established procedures. For further discussion, see, Tr. 13159-13160. However, the issue before the Board is not the absence or presence of foreman override per se, but whether the evidence concerning foreman override indicates that the quality assurance program was not working. Thus, the issue before the Board is whether instances of foreman override went undetected and uncorrected, and whether they were of such a magnitude as to indicate a significant breakdown in the quality assurance program.

## III. BOARD FINDINGS

### A. Summary of Issues Considered and Board Findings

5. In order to arrive at a conclusion whether the evidence of foreman override, as we have defined it, demonstrates a significant breakdown in the quality assurance program at Catawba, we have looked at the allegations and attempted to answer the following questions: (1) Did the allegations of foreman override contain all the prerequisites of our definition (i.e., foreman direction or pressure, violation of procedure or direction to violate, and involvement of a safety-related system)? (2) If the allegations satisfied the elements of our definition, was the violation or incident detected and/or corrected by the quality assurance program? (3) If an undetected instance of foreman override was stated or shown,

was it a concern having safety significance that, it pervasive, could cast legitimate doubt on the integrity of the quality assurance program as a whole?[3/] (4) Finally, considering the crew, the shift, and the foreman involved, was a pattern apparent, and, considering the totality of the work performed at the plant, did the number, frequency or ongoing nature of the occurrences involved suggest that foreman override was pervasive?

6. Since the Board has not conducted its own independent investigation of these matters, but was presented with substantial materials and testimony concerning Applicants' and the Staff's investigations, we also considered the validity and reliability of these investigations and the weight to be attached to their findings and conclusions. In this connection, we heard substantial testimony both challenging and defending the investigative methodology, the sampling of individuals for interview, the interview questions, the atmosphere of the interviews, the completeness of the reports, the thoroughness of the follow-up of concerns stated, the validity of technical conclusions drawn, and the thoroughness of the Staff review of the Duke investigation.

7. Having examined all the evidence in light of these considerations the Board has reached the following conclusions:

(1) There were several allegations which met our standards for foreman override, which were not in fact detected by the quality assurance program at Catawba.

(2) While we did not find that any particular procedural violation or direction to violate was of safety significance, there were several allegations, which, if true, and either frequent or widespread, would raise concerns whether the quality assurance program was, in fact, working as intended.

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3/ We also considered whether any defective work alleged to have been performed as a result of a foreman override situation had gone uncorrected. However, there was little evidence of this nature.

(3) However, there were not enough allegations, much less substantiated concerns, to draw into serious question the overall effectiveness of the quality assurance program. The number of allegations which had any substance at all was very small, both in absolute terms and considering the totality of the work under consideration. Moreover, as suggested by the Applicants and Staff reports, a very small number of foremen were implicated, and taking the allegations as true, only two or three exhibited a proclivity to engage in foreman override activity.

(4) Finally, although some methodological questions were raised, we found the investigative methods used to be basically sound, and the findings and conclusions extremely well documented and supported.

B. The Validity and Reliability of the Staff and Duke Investigations

8. Approximately two-thirds of the time available for cross-examination was taken up by challenges to, and defense of, the respective investigations of the foreman override allegations by the Applicants and the NRC Staff. Palmetto Alliance focused a great deal of its attention on the adequacy of Duke's investigative methodology, including selection of craftsmen to interview, the way in which interviews were conducted, the completeness of the affidavits, the completeness of the final Duke report, and the adequacy the NRC Region II investigation and monitoring of Applicants activities.

9. There were, in fact, three significant investigations into the extent and significance of the Welder B and related concerns:

(1) the Region II investigation of foreman override, which initially emphasized Mr. Nunn's concerns, and later focussed on Welder B's concerns (Tr. 13785-789, Uryc, Economos; Staff Exs. 27, 31);

(2) the Duke investigation based on the six areas of concern raised by the initial Region II investigation (see, generally App. Ex. 116); and

(3) Region II monitoring and follow-up activities to verify the validity and reliability of the information developed by Duke (see, e.g., Tr. 13847-864).

10. Palmetto Alliance gave relatively little attention on cross-examination to the initial Region II investigation. However, the Staff undertook a substantial investigative effort to itself determine the scope of foreman override, well before any Duke investigation began. As documented in the record of the Fall/Winter 1983 hearings, Region II conducted 25 interviews based on the Nunn allegations and these interviews pointed to Welder B's foreman. See, Staff Ex. 27; Tr. 13911, Blake. Between early January and the beginning of March 1984, Region II interviewed a total of 53 people, 41 individuals whose interview summaries were provided to Palmetto Alliance on discovery, pursuant to protective order, and an additional 12 individuals, four being confidential sources, who provided information which tended to corroborate the original allegations of Welder B. See, P.A. Ex. 146, Tr. 13911, 13883, Blake, Uryc; Tr. 13786, Uryc. These last interviews were summarized on a special inspection report (Staff Ex. 31), and served as the basis for the March 13, 1984 meeting between Duke management and Region II officials and the initiation of the Duke inquiry. Id. Based on the twelve interviews, summarized in the special inspection report, Region II found evidence of problems involving: (1) violation of interpass temperatures, (2) removal of arc strikes without paperwork, (3) welding bend sequence [subsequently determined to be within procedure], (4) posting of "look outs" for inspectors while welding procedures were violated, (5) perception of foreman pressure for quantity, and (6) welding without proper documentation. Staff Ex. 31, at 2. The NRC's investigation did not turn up any evidence of such problems other than on Arlon Moore's second shift welding crew. Id., at 3-4; Tr. 13181, Dick. However, Applicants were advised to begin an immediate review of the issues to independently determined what problems were raised, to

investigate the possibility that the activities reported extended beyond the particular second shift welding crew, and to identify the corrective actions required for adequate resolution. Staff Ex. 31, at 2.[4/] Thus, before the Duke inquiry had begun, the Region II investigation had gathered evidence from 78 interviews, and found evidence of foreman override in only one crew.

11. The Duke investigation began shortly thereafter. See, App Ex. 113. The investigative approach included a non-Catawba site director, a review board, emphasis initially on identifying and interviewing craftsmen who had worked for the second shift foreman implicated in the Staff report, a standardized interview to be introduced by the Welding Superintendent, conducted by skilled employee relations interviewers with a list of "essential questions", and followed by a follow-up technical interview. Id.

12. The manner in which the persons interviewed were chosen and interviewed is fully described in the record. See, App. Ex. 116, at 9-11. The total number of individuals interviewed was 217: 65 of the 110 welders who had worked for Arlon Moore, 69 other Catawba welders, 48 powerhouse mechanics, 6 steelworkers, 8 electricians, 13 foremen, 2 general foreman, 4 QC inspectors and 2 others. App. Ex. 115, Hollins, at 2-3.

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4/ The Board notes that the Staff's interviews with Individual B, Individual B-1, Individual B-2,1 and Individual B-3, contain allegations concerning actions by the second shift foreman, Mr. Moore, which could not be directly explored through cross-examination, inasmuch as their identities were not revealed by the Staff to the other parties. See, Tr. 13014-15. While the interview summaries in the Staff report (Staff Ex. 31) contain allegations of specific incidents in which Mr. Moore is said to have pressured welders on his crew to violate interpass temperatures (B, B-1, B-2), weld without possession of proper paperwork (B-1 [this incident was caught at the time for a missed hold point and written up as an NCI], B-2), and remove arc strikes without paperwork (B-2), it may be noted that similar incidents were explored on the hearing record, and the Board considers these matters to have received adequate consideration.

13. Palmetto's expert witness Dr. Raymond J. Michalowski, a sociologist, see, P.A. Ex. 147, challenged the validity and reliability of the Duke investigation. Id., Tr. 13435, Michalowski. As to validity, he asserted that the questions the study set out to answer were not clearly stated, the behaviors associated with foreman override were not initially specified (for example, the perception of pressure, or actual pressure), no criteria were specified in advance for judging significance (e.g., what would be considered "pervasive"), and the sampling was not done to assure appropriate representativeness of the total population being studied. Id., at 13936-43. He viewed the study's reliability suspect due to the vagueness in the questions asked, the dependency of one questions' answers on previous questions, the use of subjective terminology, and the use of Duke interviewers when seeking "high-risk" information (i.e. - evidence of wrong-doing from one's employee). Id., at 13945-51.

14. While he initially was of the opinion that the study should not be relied on for any purpose, id., at 13957, he narrowed his criticisms considerably on cross-examination, principally to the inappropriateness of making inferences about foreman override outside the welding craft. Id., at 13976. First, he conceded the study may have been valid insofar as it undertook to find the extent of perception of violations. Id., at 13965-67. He also granted that an investigative technique is a valid approach for finding actual violators. Id., at 13969. He also agreed that if the study were attempting to generalize about the pressure an entire population is experiencing, and the sample was exclusively of sub-populations subject to high pressure, the evidence would likely overstate the incidence of high pressure being experienced by the entire population. Id., at 13973. Similarly, if increased violations were associated with high pressure,

generalizations about the population would tend to overstate the number of violations. Id., at 13974.

15. Dr. John E. Hunter, a professor of psychology and mathematics, see App. Ex. 120, disagreed with Dr. Michalowski's principal conclusion that the data did not justify drawing plant-wide conclusions. By taking the number of instances of foreman override as 10, and comparing that to the estimated number of transactions in which foreman override could occur, Dr. Hunter concluded that it was possible to validly conclude foreman override was a rare event. Tr. 14342-47, Hunter. He said this would be true even if the sample were limited to the 33 non-welding craftsmen sampled by Duke. Id., at 14347. He also noted that pooling the non-random and random samples as Duke did would be conservative, that is, it would tend to result in overstating the expected occurrences of foreman override, id., at 19356-57, since the frequency of foreman override in the non-random sample would have been greater. App. Ex. 120, at 8. He also concluded that the questions Duke asked elicited the observations needed to determine whether foreman override allegations were stated, Tr. 14311-12, Hunter, the questions were appropriately phrased so as to provide the desired information, id., at 14327-32, App. Ex. 120, at 3-4, the relative power-differential between the interviewers and the craftsmen, and the eliciting of "high-risk" information, did not affect the reliability of the information received, id., and that the data generated provided adequate justification for the generalization made -- i.e., that foreman override is a rare event. Id. at 14339-42.

16. We noted that some of Dr. Michalowski's concerns, such as the fear of providing "high-risk" information, and the "power-differential" affecting responses, were well taken. See, e.g. testimony of Individual 31,

I.C. Tr. 2103, et seq. Nevertheless, it seemed likely that even those persons who had some fear of retaliation, such as Individual 196, or were otherwise inhibited in providing information, were ready to provide information they thought might affect the safety of the plant. See, e.g., I.C. Tr. 2061, 2093, 2095-6, Ind. 196.

17. On the other hand, we found several of Dr. Michalowski's criticisms either not particularly well-taken, or impractical under the circumstances. First, Duke was obliged to follow every lead concerning foreman override, and could not simply do a random survey. Second, Duke needed the expertise of its technical organization to follow up technical issues. Given these constraints, Duke's methodology was commendable. Not only were extensive resources devoted to taking hundreds of interviews, but each technical issue was pursued by personnel with the appropriate experience and training. See, Tr. 13410, et seq.

18. The thorough-going nature of the Duke investigation is also demonstrated by the detailed manner in which specific concerns were traced back into the plant or recreated. See, e.g., Tr. 14038, Carpenter; I.C. Tr. 2053, Ind. 196. We are persuaded by the evidence adduced from Dr. Michalowski on cross-examination, and from Dr. Hunter's direct testimony, that it is unlikely that the use of the non-random investigative-snowball technique, which sought out individuals likely to have foreman override information, caused the number of instances of foreman override to be understated so as to impugn inferences based on these numbers. While the Duke investigation did not clearly define a criterion for pervasiveness, in the end this did not matter, because the incidence of foreman override was so low.

19. Our reliance upon Applicants' investigation is in no small part influenced by the depth of the on-going review of the Duke investigation undertaken by the Staff. We note, particularly, the Staff's detailed review of the affidavits for completeness, its interviews with the interviewers, it interviews with some affiants, its discussions with the engineers doing technical follow-up, and its follow-up survey of those who expressed concerns. Tr. 13848, 13865, 13883, Uryc, Blake. The fact that the NRC had talked to some of the same individuals also provided the Staff with an internal "control" with which to test the information Duke was developing. Tr. 13863, Uryc.

20. Palmetto also attempted to show that the report itself was incomplete, by toning down negative implications or leaving out significant details, particularly concerning the field testing of critical welds from Arlon Moore's crew (e.g., Tr. 13436, 13439-40, 13512, 13514, 13516, Guild), and concerning Duke's taking personnel action against a dozen supervisory personnel, Tr. 13376, Guild, rather than the five individuals noted in the August 3, 1984 report. We agree that all the details of Duke's investigation are not contained in its report, which was intended to serve as a summary of a much larger amount of material. See, P.A. Ex. 146 (9/4/84 Memo to File, B. Uryc, J. Blake). However, that is one of the principal reasons the Board ordered further discovery and hearings to probe the bases for the Applicants' findings. We are satisfied that through this process the significant details, including those as to weld testing and personnel actions, were not only made

available to Palmetto, but the subject of extensive cross-examination.[5/] In the Board's view, the full scope of information uncovered and persons responsible, was available and the subject of the hearings.

C. Evidence of Foreman Override

21. Based on follow-up interviews and technical reviews, Applicants identified 10 specific allegations of first hand knowledge of foreman override (actions by supervisors that resulted in defective work or violation of QA procedures). Tr. 13,256, 13,259, Hollins. App. Ex. 116, at 14. The Board has reviewed Applicants' report, and identified 13 instances which appear to meet Applicants' definition of foreman override -- interpass temperature violations: 4, three involving Arlon Moore, Welder B's second shift supervisor (individuals 70, 196, and 36) and one involving John Gladden (Individual 106); attempts to mislead inspectors: 4, involving four different foremen (Halterman, Barker, Gladden, and Chrisley), alleged by individuals 25, 31, 94 and 72 (also 177); look-out for QC inspector: 1, involving A. Moore welding with welder's filler material (Individual 168); direction to work without process control: 3, all involving E. Cobb, a powerhouse mechanic foreman (individuals 46, 88, 95); direction to work on

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5/ The proposed employee action plan, which summarized proposed actions to be taken against about a dozen individuals, was fully probed. See, P.A. Ex. 154; Tr. 13372 et seq.; see also, P.A. Exs. 152, 153, 155 (documenting certain personnel actions taken). Moreover, since the criteria for taking personnel action was "inappropriate supervisory action" (Tr. 13220-1, Dick), and not foreman override, the disparity in reporting asserted by Palmetto is of little significance.

ron-conformed item: 1, involving welding foreman B. Cobb (Individual 27), which was caught and non-conformed at the time.[6/]

22. The foregoing allegations of foreman override serve as our bases for examining all the evidence on these subjects.

1. Violations of Interpass Temperature

23. Of all the concerns raised about foreman override, the violation of interpass temperature limits[7/] was by far the subject of the most attention. Based on the summary of Mr. Uryc's three interviews with Welder B (a welder on Arlon Moore's crew who stated he had overheated 12 socket welds in a fabrication shop in the Unit 1 pipe chase), Staff Ex. 31, a demonstration by a welder of how he had violated interpass temperature (which resulted in interpass temperatures exceeding 700°F), Staff Ex. 33, Report Details at 2; App. Ex. 116, at I-6, and the fact that both Duke and the Staff sought to test all of the accessible critical welds of the welder with stencil 248 (whom Applicants believed to be Welder B), Tr. 13457-58, Llewellyn, there would appear to be strong evidence that at least one welder violated interpass temperature on safety-related systems as a result of pressure from Arlon Moore.

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6/ The difference between the Board's and Applicant's reading of their report appears to be that two interpass temperature incidents involved speculation as to whether interpass temperature was violated, and the last-mentioned incident, which was caught contemporaneously.

7/ "Duke Nuclear Guide 1.44, paragraph 6.0, requires that a maximum interpass temperature of 350° be observed for welding on stainless steel to minimize the weld heat affected zone sensitization area. Weld heat affected zone sensitization is manifested as a precipitation of chromium carbides at the grain boundaries of the stainless steel material. If this condition occurs and is severe, the stainless steel will be more sensitive to corrosive attack in certain aggressive environments." App. Ex. 116, App. A, at I-5.

24. Palmetto Alliance extensively cross-examined two of the four individuals on Arlon Moore's crew who had specific concerns--William Marion Carpenter and Individual 196. Individual 196 related three different incidents. In one incident, Moore took him and L. Lueke off some Class C socket welds that Moore said had to be finished by the end of the second shift and put two other welders on the job who finished the welds much faster than Individual 196 believed he could, within procedure. He concluded only that there could have been an interpass temperature violation. I.C. Tr. 2074-2076; App. Ex. 118 (Ind. 196). A second incident involved W. M. Carpenter completing several two-inch stainless steel socket welds in Henline's fabrication shop but not getting the inspector to sign off because he "would know he finished too quick." Id. However, on cross-examination, Individual 196 withdrew his charge, saying he had no knowledge as to whether procedures were violated or not. I. C. Tr. 2034.[8/] The third incident involved Bruce MacCarter telling Individual 196, when Individual 196 asked him why the weld was so hot, "I didn't want to, but Arlon said I had to get them done tonight." I.C. Tr. 2071; App. Ex. 118, Ind. 196. Individual 196 did not know what, if anything, Mr. Moore had instructed Mr. MacCarter regarding violating procedures to get the work done. I.C. Tr. 2072. Individual 196 did not mention the incident summarized in the Duke report involving 12 to 24 welds done by himself and Individual 70 in the Unit 1 pipe chase.

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8/ Despite Individual 196's concern that Carpenter may have exceeded interpass temperature while welding in Henline's fabrication shop, Mr. Carpenter stated he achieved his speed through use of an assembly line technique, and not violation of interpass temperature. Tr. 14212-214, Carpenter.

25. Witness Carpenter was aware of only one incident in which he believed he was pressured to violate interpass temperature. Tr. 14221-2, Carpenter. That incident involved Mr. Moore telling him to make another pass, when he could touch it with his finger, but not with his hand. Tr. 14015, Carpenter; 14231-2, Carpenter; App. Ex. 118 (Carpenter). However, Individual 196 testified that in order to be able to put one's hand on a weld, it could not be very much more than 100°F. I.C. Tr. 2083, Ind. 196.[9/]

26. Thus, when subjected to cross-examination, two of the four individuals with specific interpass temperature concerns were unable to provide the necessary information required to state a case of foreman override. As a result, the only remaining cases are the two mentioned by Welder B in his interviews with Mr. Uryc, the incident raised by Individuals 70 and 196 relating to overheating 12-24 welds in the Unit 1 pipe chase, all of which involve Arlon Moore, and one incident raised by

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9/ Mr. Carpenter related two other incidents unrelated to interpass temperature. One involved foreman L. Leatherwood and J. T. Hamrick, who, when asked by Mr. Carpenter about a problem with excess penetration, was told not to worry about the problem because the weld was accepted by radiography and, in addition, was subject to an ANI hold point. Tr. 14220, Carpenter. This circumstance doesn't appear to meet the Board's criteria for foreman override, in that there was no direction, explicitly or implicitly, to violate procedure.

The second involved a Class C weld and some additional Class G welds which Mr. Carpenter questioned because the tack welds, and subsequently, the root pass of the Class G welds were "black and nasty looking." Tr. 14028-29, 14225, Carpenter. Carpenter was concerned that this condition was not acceptable; Mr. Moore thought it was adequate. Tr. 14023-27. However, the QC inspector said the blackened condition on the Class C tack welds was acceptable, that there was no sign of "sugar". Id., at 14218-19. Based on acceptance of the Class C tack welds, Mr. Moore said similar blackened conditions on the Class G weld were okay; he attributed the blackness to hydrostatic testing and flushing of the pipe. Id., at 14225-227; 14027. Mr. Carpenter indicated that with respect to the Class G welds there was pressure to complete them from Mr. Moore. Tr. 14028-9, Carpenter. The Board finds this incident to be a reasonable exercise of a foreman's judgment about the acceptability of a weld, and does not involve a violation of procedure.

Individual 106 (and by Individual 33) involving John Gladden. App. Ex. 116, Append. A, at I-2; App. Ex. 118.[10/]

27. Assuming each incident to be true, and that each was undetected, we still do not find there to be evidence of a pattern of violation of interpass temperature, but rather, as asserted by Applicants, isolated cases involving two foremen, both of whom have been removed by Duke. See, App. Ex. 116, App. A, at I-8.

28. Given this finding, we need not reach the question whether, if pervasive, such practice would cast legitimate doubt on the integrity of the quality assurance program as a whole. However, based on very considerable evidence presented, the Board found that exceeding the interpass temperature, even if undetected, is of no safety concern.[11/]

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10/ Applicants attempted to develop a test which might demonstrate whether interpass temperature had been violated. However, since sensitization was shown to occur even when interpass temperature was not exceeded, the test for sensitization was not effective for this purpose. Tr. 13,906 Czajkowski, Blake; Tr. 13900-1, Blake.

11/ The laboratory and field testing of welds by Applicants, a Staff consultant from Brookhaven National Laboratories, and a consultant to Applicants, is described fully in the record. App. Ex. 116, Append. A; Staff Exs. 30, 32, 34; P.A. Exs. 144, 145, 161, 165; Tr. 13440-13457, 13473-75, 13501-04. Field testing of a sampling of safety-related welds by Arlon Moore's crew showed that two or three were sensitized, although laboratory tests had shown that sensitization can occur without violating interpass temperature, and therefore evidence of sensitization is not, itself, a reliable test for determining whether the interpass temperature has been exceeded. Tr. 13470, Kruse; Tr. 13448, Ferdon; Tr. 13906, Czajkowski. In any event, neither the Duke engineers nor the Staff found the evidence of sensitization to be of safety significance. Based on research showing that intergranular stress corrosion cracking (IGSCC) will not occur in the absence of a sufficiently corrosive aqueous environment, and evidence that sufficient amounts of corrodants will not be present at Catawba, IGSCC is not expected to occur there. Staff Ex. 30; Tr. 13609, Ferdon; Tr. 13907-8, Czajkowski. Moreover, there has never been a failure in the heat affected zone of austenitic stainless steel in a PWR primary loop (the location of the welds in question). Tr. 13890-1, Czajkowski. Thus, despite exceeding interpass temperature and sensitization of welds, IGSCC is not expected to occur as Catawba and those welds would nevertheless be safe in service. Tr. 13871, 13909, Czajkowski; Tr. 13924, Blake. Thus, the Board finds that even if some violation of interpass occurred and was not detected, it is of no safety significance.

2. Misleading Inspectors/Defeating Inspection Process

29. As noted in the initial tally of allegations of foreman override found in Applicants' report, these were four alleged incidents in which a foreman gave a direction to a craftsman which served to mislead the inspector involved, or to defeat the proper functioning of the QA/QC system for maintaining quality construction. Each involved a different craft foreman. Two were the subject of cross examination.

30. Identification of Redheads. C.W. Braswell, a powerhouse mechanic, related that a QC inspector had come to him asking him to identify some redheads (expansion bolts) which had been installed in the number one reactor loop a year before with a torque wrench which was the subject of a deficiency report (R-2A) for being out of calibration. App. Ex. 118 (Braswell); Tr. 14175-77, Braswell. Braswell couldn't remember the exact location, but was able to point out the "loop" involved and the inspector was able to check the redheads on it. Tr. 14176, Braswell. Mr. Braswell said his foreman, Ed Halterman, told him just to point out some redheads; but he could not remember if he was told this before or after the loop was checked, and did not know whether Mr. Halterman was serious or kidding. Id.

31. Although it is possible to interpret these events as a conscious effort of a supervisor to mislead the QC inspector, and thus interfere with the QA resolution process to assure proper torquing of bolts (see Tr. 14177, Braswell), the element of foreman direction to violate a QA procedure is not clearly evident, even taking everything Mr. Braswell said as true. Mr. Braswell could not identify another foreman override incident. Id., at 14178-83. He did not leave the impression that Mr. Halterman had a proclivity to mislead inspectors, and the end result of this interchange was that the inspector identified the appropriate area, if not the specific bolt, and

the purpose of the R-2 procedure was contemporaneously accomplished. As a result, we are satisfied that the QA program was working in this instance, and have no evidence of this being symptomatic of a broader phenomenon.12/

32. "Tell the ANI You Found the Defect." Individual 31 related an incident in the Unit 1 pipe chase in which he had repaired the same weld four or five times because the radiograph kept showing a rejectable condition. The last time it came back, Individual 31 discovered that the x-ray department had been sending the wrong weld package. However, instead of telling Individual 31 to inform the Authorized Nuclear Inspector (ANI) that there had been a mix-up, his foreman, H. Barker, told him to tell the ANI that he had found the defect and get the hold point signed off. Rather than do this, Individual 31 told the ANI of the mix-up, and both welds were red-tagged. App. Ex 118, Ind. 31; I.C. Tr. 2107-2110, Ind. 31. According to Individual 31, Mr. Barker had wanted to get the matter of the mix-up resolved without causing the radiographers involved any trouble (they both received disciplinary "A" violations as a result of this incident). I.C. Tr. 2110-2113, Ind. 31.

33. This allegation meets our definition for foreman override. The foreman directed the welder to cover up a mistake in violation of the process control procedure, to avoid having the welds non-conformed and the radiographers disciplined. Had Mr. Barker's actions been discovered, he may very well have been cited for obstructing the proper functioning of quality assurance procedures, in this case, QAP Q-1. Although the specific

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12/ Mr. Braswell related an incident involving direction by his foreman, Ken Dodd, not to install an expansion coil specified in a design drawing, but this incident involved non-safety related work, and thus falls outside our definition of foreman override. See, App. Ex. 118 (Braswell); Tr. 14166-171, Braswell.

"hardware" deficiency was identified to the inspector and corrected, the foreman's actions were not. The Board did not hear enough evidence to determine the circumstances of the radiographer's error, and whether the incident could have led to failure to make appropriate repairs. However, it is clear that were this to be allowed to happen, and foreman cover-up of such errors on safety-related systems a widespread occurrence, doubt could be cast on the effectiveness of quality assurance program. In the absence of other such incidents, however, and in light of the integrity exhibited here by the welder, there is no evidence of a pattern of obstruction or of an uncorrected safety problem.[13/]

34. Stenciling Welds Done By Others. Another incident was described in the Duke report, and in affidavits, but was not the subject

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13/ Individual 31 related two other incidents involving Mr. Barker, but neither, in the Board's view, were foreman override. One involved the resolution of an NCI relating to Individual 31's welding technique, where, upon showing the resolution to Individual 31, Barker instructed him to remove the red tag (Q-1B). I.C. Tr. 2116-18. Under these circumstances, an instruction to remove the red tag could have been entirely proper under the Q-1 procedure. Tr. 14247-48, Davison.

The other incident involved a weld made by Individual 31 in the reactor upper head injection system, where another welder had been having trouble doing the tack weld, which Individual 31 eventually was able to accomplish. However, the other welder got Mr. Barker to look at Individual 31's root pass. After initially saying it didn't look good, Barker changed his mind, indicating the problem was "an illusion". Individual 31 "thought it looked as it should be" and finished the weld. Individual 31, who appeared to the Board to be a very nervous, worrisome individual, became concerned that the foreman and other welder had seen something he hadn't, but later learned it had "shot" one hundred percent. Upon learning this, Barker, he relates, assured him: "That's all you can do." I.C. Tr. 2121-24. This matter was followed up by Duke, with Mr. Kruse meeting with Individual 31 to explain that the weld had indeed shot one hundred percent. Id., at 2134. The Board finds this incident does not involve either a procedure violation or direction or pressure by a foreman, but merely the performance of a foreman's function of providing guidance to a welder, who in fact was not in disagreement with the foreman about the decision made.

of cross-examination. Our review of the affidavits shows that the incident, related by both Individual 72 and Individual 177, involved foreman Johnny Chrisley telling the two welders that one of them had done the welds (fastening angle iron clips to ceiling rails in the control room) and someone had to stencil them so they could be signed off. One (Individual 72) said he didn't do them and refused. The other (Individual 177) said he stenciled 35-40 welds which he had not done, but that those he didn't feel comfortable about, he rewelded or repaired. He said he did it because the foreman told him to. App. Ex. 116, App. A, Sec. VI; App. Ex. 118, Inds. 72, 177.

35. Applicants concede that, if true, this action violated a Duke, but not a code, procedural requirement. App. Ex. 116. App. A, Sec. VI. This is within our definition of foreman override. In addition, this incident was not detected by the QA program. However, as noted by Applicants, all appropriate inspections were made, all were acceptable, and all Duke welders are qualified to perform the welds in question. Id. The principal rationale for stenciling welds, as we recall from our earlier deliberations in the Fall of 1982, is to assure that if bad welds are made, the welder involved can be traced. If bad welds could not be traced to the appropriate welder, it would be difficult to either remove or retrain the problem welder. This would lead to an excessive number of faulty welds failing inspection and needing rework, but not necessarily a bad end product Thus, we do not find this type of violation to be of the significance that would implicate the integrity of the QA program, if pervasive. Moreover, although Individual 177 said Mr. Chrisley had asked him on one other occasion to stencil a weld he didn't make, there was no evidence that this was a widespread problem.

36. "Get Another Inspector". A last incident was related by Individual 94, in which he discovered that a hold point had been missed, which he verified with a QC inspector. However, his foreman, John Gladden, told him to get another inspector, and that the other inspector might miss the problem and sign off the weld. Individual 84 informed the first inspector, who apparently alerted the second inspector, who told Mr. Gladden he would not sign off the work. Individual 94 considered this direction to violate a procedure. App Ex. 118, Ind. 94.

37. This incident also involved an attempt to cover up a violation of procedure, which a diligent welder thwarted. While this was foreman override, it was detected, through the action of the welder. The foreman had been removed prior to the investigation. App. Ex. 116, Append. A, at I-8. Thus, the evidence suggests that the QA program in both the Construction and Quality Assurance departments was working.

38. In sum, while there is evidence of a few attempts (one each by four foreman) to thwart the inspection process, in only one case was the attempt successful. In the others, the QA program appeared to work. In the remaining incident, the problem, though not widespread, was of little safety concern, even if widespread. Thus, we find that these incidents do not demonstrate a breakdown in the QA program.

3. Direction To Work Without Process Control

39. Applicants' August 3, 1984 report notes five incidents in which craftsmen (Individuals 77, 94, 46, 95 and 88) stated they were directed to work on hangers or to fit up pipe without having the necessary paperwork (process control) in their possession. App. Ex. 116, App. A, Sec. III. According to the report, four of the five involved one powerhouse mechanic

foreman, Ed Cobb, and the other, John Gladden. None of these incidents was the subject of cross-examination, but are discussed in the related affidavits. See, App. Ex. 118. Further, Individual 196 testified he was told by Individual 109 that Arlon Moore told Individual 109 to start welding without process control. The affidavit of Individual 88 (mentioned in Applicants' report) also related an incident in which a welding foreman, Dave Williams, instructed a welder to make a tack weld without paperwork. Individual 88 said that, of his own accord, he watched to see that no one was coming. App. Ex. 118, Ind. 88. Finally, Individual 88 mentioned an incident in which he and Individual 77 had been working on a hanger but Individual 77 left with the paperwork, and in his absence two other powerhouse mechanics finished the work. Id. As noted by Applicants, in the incidents involving Individuals 46 and 95, the paperwork was nearby, App. Ex. 116, 118 (affidavits), and this appeared to be the case in one of the incidents recounted by Individual 88. Individual 94 related that he refused to follow Mr. Gladden's instruction. Id. Individual 77 said, with respect to his own concern, that he talked Mr. Cobb into waiting for the paperwork.

40. Applicants acknowledge that craftsmen were required by quality assurance procedures to have possession of the process control information while performing work, so that it is available for reference as necessary. App. Ex. 116, App. A, at III-2. Thus, direction to work without such paperwork is improper, and appears to constitute foreman override. Second, there is no evidence that these incidents were detected by the QC inspectors, although some craftsmen simply refused to go along with the violation. Third, there does appear to be a limited pattern here, which involves one particular powerhouse mechanic foreman, Ed Cobb. Although three other foremen are mentioned, the incidents appear isolated. The evidence suggests

that Mr. Cobb had a practice of keeping the work going, even if paperwork was not with the craftsman, as required. Although both Arlon Moore and John Gladden were the subject of other foreman override incidents, the two incidents related do not demonstrate a proclivity to direct work without process control. The name of Mr. Williams, also mentioned here, does not appear again, to the Board's knowledge.

41. If craftsmen were regularly forced to work without being allowed to refer to the appropriate controlling procedures, the opportunity for workmanship error could reasonably be said to increase, and part of the quality assurance program would not be working. Nevertheless, if errors were to occur, defective work would be subject to inspection, as noted by Applicants. App. Ex. 116, App. A, Sec. III. We are not, however, prepared to say that the evidence shows that work without process control was pervasive, based on these few incidents involving mainly just one foreman. Moreover, we are also mindful of our earlier findings that, in general, Applicants' system of process control in the welding area worked rather well.

42. The Board therefore finds that although one foreman appears to have had a proclivity to direct that work continue in technical violation of procedures, this practice was not, in fact, widespread, and, because of the inspection process, is unlikely to have led to the quality assurance program failing to detect faulty work. These incidents do not demonstrate a significant breakdown of the QA program.[14/]

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14/ Sam Nunn, testifying over the objection of Applicants and the Staff, related to the Board that a former welder on Mr. Moore's crew, Mike McKelvey told Nunn that he had "made more illegal repairs than anyone else." Tr. 14260, Nunn. According to Nunn, Billy Smith and Arlon Moore asked McKelvey to repair an X-ray weld before inspection, without noting his stencil or filler material. Finally, Mr. Nunn

(FOOTNOTE CONTINUED ON NEXT PAGE)

4. Posting Look-outs

43. While not the subject of cross-examination, the practice of posting look-outs was covered in the Duke report. App. Ex. 116, App. A, Sec. II. Two incidents, related by Individual 168, concerned look-outs for Bill Burr, posted by Arlon Moore, one while he assisted the welder in grinding out a spot where the welder had blown a hole in a backing ring. However, this was on Class G, or non-safety-related, pipe. Id.; App. Ex. 118, Ind. 168. In addition, the foreman was permitted to perform this grinding. App. Ex. 116, Append. A, Sec. II.

44. The other incident involving Mr. Moore also didn't occur in relation to safety-class pipe, but did involve violation of filler material controls (QAP H-3) in that Moore used the welder's filler material, rather than checking out his own. Neither incident meets our definition of foreman override, and the one incident involving a violation did not directly relate to the quality of the weld, but rather related to the desirability of being able to trace bad welds to those who made them.

45. Three other incidents were described on the Duke report, but none involved a foreman. App. Exs. 116, App. A, Sec. II, 118 (Inds. 46, 177, 191).

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14/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE)

said that Duke wanted to rehire McKelvey (who was then at the Shearon Harris site) as a welding engineer to write new procedures to cover his illegal repairs. This last matter Mr. Nunn himself found to be difficult to believe. Id., at 14263. However, when asked by the Chairman if he had anything new to relate, Mr. Nunn replied he wasn't aware of "anything new, any specific incident." Id., at 14267. While we appreciate Mr. Nunn's continuing concern, due to the lack of specifics, the lack of substantiation, the inherent unreliability of this sort of hearsay (some of which Mr. Nunn himself found incredible), we are not inclined to attach much weight to these statements. Moreover, even if true, the information provides little more than general reinforcement that Arlon Moore had a tendency to cut corners to meet production goals. In this respect such testimony is cumulative.

46. Inasmuch as none of these allegations states a case of foreman override as the Board has defined it, we find there to be no evidence to support foreman override with respect to posting of look-outs. See also, Staff Ex. 35.

5. Cold Springing

47. Although Applicants included "cold springing" in Appendix B of their report, indicating their view that foreman override was not present, Palmetto Alliance nevertheless attempted to show that foreman override occurred in this activity. Tr. 14095, et seq. Cold springing, which involves the use of come-alongs and chain falls to force fit mis-matched pipe ends so they can be welded, Tr. 13567-68, Mills, was a subject considered and resolved in the initial PID.

48. James Boyd McCall, a powerhouse mechanic, alleged that he, a welder, and several inspectors had allowed the force fitting of a pipe using one come-along and three chain falls without first using a dynamometer to determine the force needed and without proper documentation, as required by CP-483. Tr. 1401, McCall; Tr. 13561, 13564, 13579-80, Mills. The welding foreman, Jim Johnson, was told the pipe could not be hand-fit, but told them to go ahead and pull it over. Mr. McCall contacted Ronald Kirkland, a QC inspector, who went to his supervisor, Bill Deaton, returned, and told them to proceed to make the fit. Tr. 14103-06, McCall.

49. The crew members, foreman and QC inspector in this case all believed the cold springing was acceptable, under QA procedure M-4. Tr. 14110, McCall; App. Ex. 116, Attach. B, at III-1. However, NCI 18304 was originated on April 5, 1984, to document the cold spring, id., and it was determined that the force used violated CP-483. Tr. 13574-75, Mills.

It appears that the foreman and QC inspector had mistakenly relied on QAP M-4, which states that jacks, jigs and other fixtures can be used to align a fit, but had not considered CP-483, which specifically addresses cold springing. Tr. 14099-100, 14110, 14114, 14135, McCall; Tr. 13574-75, 13580-81, Mills.

50. Mr. McCall also related an incident which occurred soon after, involving use of a porta-power hydraulic jack, but no foreman was involved, and, in any event, it was observed by a QC inspector and non-conformed. Tr. 14116-20, McCall.

51. While two other cold-springing incidents were mentioned in affidavits, none of these involved intervention of a foreman. Tr. 13561, 13568-9, Mills; App. Ex. 118, Inds. 127, 163, 198, 168. See also, Tr. 13570-74, Hollins, Llewellyn.

52. None of the above incidents involve a direction by a supervisor to violate a procedure and thus do not state a case of foreman override. While in the first case, the QA process did not identify the violation, it appears from the second incident shortly thereafter, that a similar violation was indeed caught. In addition, design engineering determined the cold spring to be insignificant from a safety perspective. Tr. 13581-3, Mills. From one isolated case, we cannot draw an inference that a significant breakdown of the QA program occurred.

6. Removal of Arc Strikes Without Process Control

53. Although the allegation that welders were improperly instructed to remove arc strikes from valves and piping without paperwork was raised by the April 1984 NRC inspection report, Applicants treated the matter in Appendix B of their report, based on their finding that there was no foreman override. See, App. Ex. 116, App. B, Sec. I. Arc strikes are scars or

marks left on welds, valves or piping when a welder inadvertently touches his welding rig to such a structure while moving the rig or making a weld. Tr. 14128, McCall. The principal concerns raised by arc strikes are the possibility of cracking in the piping, assurance that minimal wall thickness for piping is maintained after removal of an arc strike, and the possibility that some other undesired material is left on piping or valves. Tr. 13595, Van Malssen, Llewellyn.

54. Duke's M-4A procedure permits the welder to remove arc strikes in the weld zone (within one inch on either side of the weld) without process control. Since the foreman is responsible for all welds performed by his crew, he or his subordinates are permitted to perform the work. Tr. 13594-95, Llewellyn, Grier.

55. While about a dozen individuals identified such concerns, see, Tr. 13591, Llewellyn, only one appeared to be a violation which had not been caught. In that case, Individual 109 stated that his foreman, Arlon Moore, had filed off several minor arc strikes on a valve under the 1-A steam generator and instructed him to do the same. App. Ex. 118, Ind. 109. In a follow-up interview, he said he was unsure of the location of the arc strikes. App. Ex. 116, App. B, at I-2. Another welder, Individual 196 corroborated this account, but had no direct knowledge if there were any file marks or where they came from, although he had seen what appeared to be file marks on the body of the valve. I.C. Tr. 2038-40, 2060. Applicants conducted a further analysis in order to determine whether improper filing had been done on other valves welded by members of Individual 109's crew and to confirm the location of the valve he identified. Applicants confirmed the location of the valve with Individual 109 and their examination of 19 other accessible valves performed by this crew revealed

that any filing or grinding marks outside the weld zones on these valves were performed by the manufacturer. Tr. 13597-98, Kruse; See, also, App. Ex. 116, Attach. B, at I-2. Individual 196 also testified he was satisfied that the marks on the valve, raised in his and Individual 109's concern, occurred at the manufacturer. I.C. Tr. 2061. According to the evidence above, the foreman's decision to remove minor arc strikes was technically correct, since he is responsible for any arc strikes on components welded by his crew.

56. Additional concerns raised included: the removal of superficial arc strikes in the weld zone, which is not a procedure violation since no process control is required; the removal of deeper arc strikes or those outside of the weld zone without proper process control, which was detected by QA; or general allegations of arc strike removal in the past about which no specific information was available. App. Ex. 116, Attach. B, at I-3 - I-4; see, also, App. Ex. 118, Inds. 5, 37, 102, 131, 168, 176, 186, 191, 194, and 208.

57. In only one case was there direction by the foreman to remove arc strikes, but since it was determined to be in the weld area of the valve, it was not a violation of procedure. QC inspectors found and resolved those cases of arc strike removal which were, in fact, improper. Although one or more cases of foreman override may have been stated, subsequent evaluations indicate that none, in fact, occurred.

58. Moreover, Applicant's Quality Assurance Program provides for walkdown inspections under procedure M-4 to assure that any construction damage, including arc strikes, is located and corrected after piping is inspected. Id.; Tr. 14144, McCall. Thus, even if some arc strikes had been improperly removed, any significant construction damage would likely have been caught by QC inspections. See, Tr. 13652, Van Malssen. We find, based on this evidence, that the QA program was working.

7. Conclusion

59. Based on their investigation, which assumed each allegation of foreman override to be true, App. Ex. 116, at 26, Applicants concluded that "an extremely limited number of foremen were involved and the incidents of foreman override were isolated and random." Id., at 3. Evidence pointed particularly to the interaction of one welding foreman, Arlon Moore, and his general foreman, Billy Smith. Id., at 26-27; Tr. 13182-4, 13205-7, Dick.

60. Based principally on their own inspections, both those specifically relating to foreman override, and the totality of NRC inspections over 10 years, and as reinforced by the Duke inquiry, the NRC Region II witnesses agreed. Tr. 13754-55, 13759, 13861, Blake; Tr. 13,881-83, 13913-16, Blake, Uryc. Applicants also recognized that more attention to random inspections was required on the second shift. Tr. 14244, Davison; P.A. Ex. 151. The NRC cited Duke for not adequately monitoring the QA program in the Construction Department, but determined the violation to be "level 4", due to the limited nature of the problem. Tr. 13751, Blake; Staff Ex. 33; see, Tr. 13386, Dick. Based on the depth and thoroughness of these Staff and Duke inquiries, as well as the Board's own review of the underlying evidence, we accord substantial weight to the Staff and Applicants findings.

61. While three foremen appeared to have a proclivity to permit procedural violations to occur in order to meet production goals, and we noted isolated cases involving several others, there was no pattern of foreman override among Billy Smith's crews, or elsewhere. The number of incidents which could be said to have the potentiality for affecting plant safety was very, very small indeed -- perhaps a handful. We note that Applicants have taken appropriate personnel action, either previously or as a result of the recent inquiry, against the foremen implicated. In no

case presented to the Board did the directives of these foremen lead to unsafe construction. Several of the foremen override actions, if pervasive, had the potential of affecting the integrity of the QA program -- notably failure to insist on having process control in hand, and attempts to defeat identification of non-conformances or appropriate resolution of construction deficiencies. However, the evidence of such actions was extremely limited in relation to the activities and workforce under review. We find that Applicants have demonstrated reasonable assurance that the concerns arising from the Welder B allegations do not represent a significant breakdown in the quality assurance program at Catawba.

## IV. CONCLUSIONS OF LAW

Based on all the evidence presented on the matters over which we retained jurisdiction under condition 2 of our June 22, 1984 Partial Initial Decision (at page 272), we conclude that Applicants have demonstrated reasonable assurance that the Welder B and related concerns do not represent a significant breakdown in quality assurance at Catawba. Condition 2 placed on the Board's June 22, 1984 Order is thereby satisfied.[15/]

Respectfully submitted,

George F. Johnson
Counsel for the NRC Staff

Date at Bethesda, Maryland
this 26th day of October, 1984.

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15/ By Order of August 22, 1984, the Board dismissed Intervenors' late-filed contention on the Catawba emergency diesel generators, which thereby removed condition 3 of the June 22, 1984 PID.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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| In the Matter of | ) | |
| | ) | |
| DUKE POWER COMPANY, ET AL. | ) | Docket Nos. 50-413 OL |
| | ) | 50-414 OL |
| (Catawba Nuclear Station, Units 1 and 2) | ) | |

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF'S PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW ON FOREMAN OVERRIDE IN THE FORM OF A SUPPLEMENTAL PARTIAL INITIAL DECISION" in the above-captioned proceeding have been served on the following by deposit in the United States mail, first class, or, as indicated by an asterisk, by deposit in the Nuclear Regulatory Commission's internal mail system, or, as indicated by double asterisks, by express mail, or, as indicated by triple asterisks, by hand delivery, this 26th day of October, 1984:

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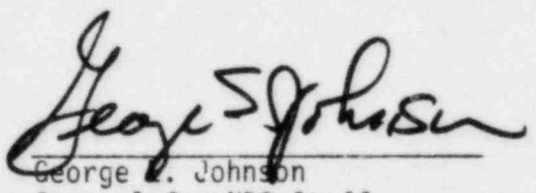

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