

ENCLOSURE

HARTSVILLE NUCLEAR PLANTS A AND B  
REINFORCING BAR CADWELD SPLICES  
FINAL REPORT  
NCR HNP-B-8

On August 29, 1978, TVA notified NCR-OIE, Region II, Inspector R. W. Wright, that the subject NCR was potentially reportable. This is the final report on the subject NCR.

Description

On August 7, 1978, a TVA QC inspector was making an end-of-shift tour of the unit B1 fuel building basement when he saw a recently fabricated vertical reinforcing bar cadweld splice. He stopped to inspect the cadweld and noted that the cadweld contained unacceptable voids. Since he did not have a "hold" tag with him, he decided to return the next day with a tag. When he returned the next day, he discovered that foreign material had been added to the cadweld in an attempt to fill the voids so that the cadweld would appear to be acceptable. Subsequent investigation of other cadwelds revealed that foreign material had been added to them. NCR HNP-B-8 then was written on August 14, 1978, and an expanded investigation was begun to determine the extent of the problem.

The investigation involved the inspection of over 3,000 cadwelds, both vertical and horizontal, located in both units of plant B. A total of 40 cadwelds were found to have had foreign material added to them. Cross-sectioning of a sample of the cadwelds showed that reinforcing bar tie wire had been placed inside the cadweld sleeve and then melted with a torch in an attempt to fill unacceptable voids or to cover slag. The altered cadwelds were limited to vertical splices.

Plant A personnel were notified of the plant B situation. Plant A personnel began their own investigation for possible tampering. Unit A1 was not inspected because all of its cadweld splices were installed under constant surveillance by TVA QC inspectors which precluded tampering. All accessible cadwelds on unit A2 were inspected and no signs of tampering were found. A review of records revealed that the first batch of cadwelds fabricated for unit A2 included three that had been tampered with in an attempt to cover slag. These cadwelds were in the basement of the unit A2 reactor building. These cadwelds had been fabricated in the latter half of June 1978 and the tampering discovered by the post-fabrication inspection. One work crew was found to be responsible and was restricted from doing cadwelding. No altered cadwelds were discovered in plant A after this June occurrence.

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### Safety Implications

The altered cadwelds did not constitute a significant safety hazard to the plant. Less than 1.5 percent of the cadwelds examined had been altered, and the altered cadwelds were not grouped together. The altered cadwelds would not be as strong as properly fabricated cadwelds due to the voids. The overall strength of the concrete structure they would be part of would not be affected since only a small number of cadwelds scattered throughout the structure were involved. However, if the tampering had gone undetected and uncorrected, it may have continued to the point that a significant safety hazard would have been created. Also, the tampering indicated that the craftspeople felt it was better to conceal unacceptable work rather than to rework or repair it. This is not a desirable nor acceptable attitude for construction of a nuclear power plant.

### Corrective Actions

All cadweld splices fabricated after May 26, 1978, were inspected for plant B. Cadweld splices fabricated before that date were installed under constant surveillance of TVA QC inspectors which precluded tampering. No cadweld splices fabricated after May 26, 1978, had been embedded in concrete.

Unit A1 was not inspected since its cadweld splicing had been installed under constant surveillance by TVA QC inspectors. All accessible cadwelds on unit A2 were inspected and no signs of tampering were found. As with plant B, no cadweld splices had been embedded in concrete that had not either been inspected during fabrication or reexamined for signs of tampering.

All altered cadwelds that were discovered have been repaired or replaced. Altered cadwelds that joined reinforcing bar to plate have been repaired by welding a new cadweld sleeve to the altered one and then cadwelding reinforcing bar into the new sleeve. Altered cadwelds joining two reinforcing bars have been cut out and replaced with two new cadweld splices.

Craftspeople have been informed that the alterations have been discovered and will not be permitted. The work crews that fabricated the altered cadwelds have been removed from cadweld work and will not be assigned any cadwelding in the future until they are recertified. The specific individual(s) responsible for the tampering cannot be determined.

TVA QC inspectors have been informed of the problem and instructed to inspect finished cadweld splices closely enough to spot altered splices. Any altered cadweld splices will be rejected.

TVA believes that these actions will preclude such tampering in the future.