

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING CONTINUED OPERATION OF SURRY STEAM GENERATORS
VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNIT NO. 1
DOCKET NO. 50-280

Introduction and Background

Virginia Electric and Power Company (the licensee) shutdown Surry Unit No. 1 on August 1, 1980 when the indicated primary to secondary leakage in the "1C" steam generator (SG) became greater than the 0.3 GPM allowed in the license. Subsequent hydrostatic tests revealed that tubes R17-C75, R19-C76, R16-C71, and R5-C64 were leaking in the "1C" steam generator. The licensee has determined tube R17-C75 to be the source of most of the leakage that led to the shutdown. The other tubes showed slow and steady drips during hydrostatic testing.

Leaking tubes R17-C75, R19-C76, and R16-C71 exhibited large volume eddy current indication typical of the O.D. wastage phenomenon which has been observed previously in the central bundle region. These three tubes are located near the zone (central bundle region) of the previously observed wastage activity and had never been inspected prior to this outage. Based on the above findings eddy current tests (ECT) were performed on tubes surrounding these three leaks and other tubes in the same vicinity which may exhibit significant tube wastage activity. This inspection included all tubes within an area bounded by Columns 69 and 79 and Rows 13 and 24 (132 tubes total). The results revealed that all three leaking tubes exhibited 100% through wall indications about one-half inch above the tube sheet. The inspection program revealed an additional six (6) tubes with ECT indications equal to or greater than the 40% plugging limit. Only one other tube exhibited wastage in excess of 30%, and the remaining indications observed were less than 30%. The six (6) tubes which exhibited a 40% indication or greater were plugged as well as the three (3) leakers and their surrounding tubes (including the diagonally next tube).

The R5-C64 leaking tube is located adjacent to tubes previously plugged due to denting adjacent to the tube lane. In addition to the leaker, an additional 16 tubes in the vicinity were also inspected for indications of denting. The results revealed that tube R5-C64 passed the 0.610 probe; however, a 0.650 probe was stopped at the third support plate indicating the location of the dent. The sixteen (16) other tubes inspected permitted passage of the 0.650 inch probe to and beyond the seventh support plate. Thus, none of these tubes exhibited significant denting. Tube R5-C64 and five surrounding tubes were plugged to conform with the Surry Unit 1 plugging criteria for denting.

A total of twenty-nine (29) wastage related tubes (includes leakers plus adjacent tubes that were not plugged previously) and six (6) denting related tubes (leaker and five adjacent tubes to the leaker that were not plugged previously) were plugged during this outage.

Evaluation

We have reviewed the licensee's submittal dated August 6, 1980 regarding the steam generator inspection and plugging performed as a result of the August 1, 1980 steam generator leak occurrence. We find that there is an adequate basis to permit Surry Unit 1 to return to power for the remainder of its authorized six (6) month operating interval with reasonable assurance of continued safe operation. All leakers and surrounding tubes have been plugged. Additional tubes in the vicinity of the leakers were ECT inspected and gauged, and additional plugging was performed in accordance with existing criteria. The existing leak rate limits assure that even if through wall cracks and leaks occur in service, they will be detected and appropriate corrective action will be taken before an individual crack becomes sufficiently large to be unstable under normal operating, transient, or accident conditions.

Unit 1 is scheduled to operate for approximately five to six additional weeks at which time it will be shutdown for steam generator repair.

Environmental Consideration

We have determined that this action does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that this action is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared.

Conclusion

We have concluded, based on the consideration discussed above, that: (1) because the action does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the action does not involve a significant hazards consideration, (2) there is reasonable assurance

that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and will not be inimical to the common defense and security or to the health and safety of the public.