SUPPLEMENTAL SAFETY EVALUATION REPORT
HOPE CREEK GENERATING STATION
POWER ASCENSION TEST PROGRAM ACCELERATION

INTRODUCTION

This safety evaluation describes the staff's review of test program changes submitted for approval as part of the program to accelerate power ascension testing for the Hope Creek Generating Station. The proposed changes were submitted by letters from Public Service Electric and Gas Company (PSE&G), dated November 6 and December 9, 1985. These changes are as follows:

1. Test 3: Elimination of Fuel Loading Chambers (FLC) during fuel loading
2. Test 5: Control rod scram time testing modification at full reactor pressure
3. Test 11: Process computer test OD-11 elimination
4. Test 16: TIP uncertainty test deletion

Test 3: Fuel Loading Modification

Test 3 is the fuel loading phase of initial operations. It has usually been necessary in past fuel loadings to use FLC in addition to SRM detectors to achieve Technical Specification required count rates with (any) fuel in the core. A number of utilities have in the past requested and been granted reload fuel loading operations in which a small number of fuel assemblies are loaded before the usual required count rate on SRM or FLC are (necessarily) achieved. This initial loading is sufficient to provide the needed count rate. These exceptions are based on the fact that the permitted (small) number of assemblies can not be critical, even with all control rods removed.

The proposed modifications to Hope Creek Test 3 are to permit the loading of 16 assemblies without (necessarily) meeting the usual required 0.7 counts/sec for the SRM or FLC. This too is based on analysis (by GE) which shows that this array would not be critical (with rods out) and would provide the necessary count rate. This change would make it unnecessary to use FLC, which interfere with operations, and would permit the use of the standard SRM alone. (The FLC could be used, if needed.) The procedure places the sources in the alternate locations, close to the SRM and uses a spiral loading pattern around the initial source-SRM and 16 assembly locations rather than around the core center.

These procedures are compatible with a number of previously approved reload procedures. The criticality calculations are done with standard methodology. They are consistent with other analyses reviewed in this area. Tests on other reactor startups indicate that required count rates should be achieved. The Technical Specifications will require (after loading 16 assemblies) the usual count rate on at least one SRM (the SRM near the initial loading). The other SRMs will be checked with a source, as has been approved for other reactors, until they reach a suitable count rate. A new Technical Specification, 3/4.10.7, has been added to provide for this first cycle revised procedure and surveillance. It provides acceptable restrictions of this procedure. If the described procedures are followed, the proposed change to the loading process, surveillance and Technical Specifications is acceptable.

Test 5: Control Rod Scram Time

Test 5 is concerned with testing of control rod drives. As part of the test rods are scram time tested after fuel loading at cold shutdown. During reactor

heatup four selected rods are time tested at various reactor pressures. Normally all rods are time tested at rated pressure and low power, and again four rods are selected for testing during power ascension. PSE&G has proposed that this sequence be modified such that the test of all rods at rated pressure and low power be replaced with a test of four rods and a test at approximately 30 percent power of all withdrawn rods as part of the scram in the Loss of Offsite Power test. This would result in the 37 "Control Cell Core" (CCC) rods not being fully tested since they would not be fully withdrawn.

GE has analyzed the reactivity worth of the scram over the insertion range of interest to transient analyses and found only a small difference in reactivity insertion between the scram of all rods and a scram in which the CCC rods and 8 other (assumed) extreme, inoperable rods do not insert. (The CCC rods are low worth rods.) They have also reexamined the transient analyses of events with this reduced scram function and determined a MCPR penalty to be applied for the assumption that these rods do not participate in the scram. The operating limit MCPR (OLMCPR) is increased by no more than 0.01 for either the ODYN option A or for the curve of OLMCPR vs measured scram time for ODYN option B. The proposed ODYN scram time would involve only those rods fully measured in the scram time test.

PSE&G has proposed Technical Specification changes which would (1) exempt, for first cycle only, the 37 CCC rods from scram time tests in Specification 4.1.3.2 and .3 and (2) increase the OLMCPR by 0.01 in Specification 3/4.2.3 and related figure.

Our review has found that since (1) all rods will have been scram tested at cold conditions, (2) four rods will have been tested during heatup, including full pressure, and thus indicate any departure from normal trends, (3) rods will be tested at 30 percent power except for exempted CCC rods, (4) analysis indicate little reactivity worth change during times important for transient analyses, and transients have been rexamined assuming no scram at all for CCC rods and 8 inoperable rods and suitable OLMCPR adjustments have been made to account for changes, (5) the delay of testing until 30 percent power is consistent with the Technical Specifications which allow operation up to 40 percent power following core alterations before scram time testing, and (6) suitable Technical Specifications have been proposed to exempt CCC rods and to increase OLMCPR, the proposed changes to the Test 5 procedures are acceptable.

Test 11: OD-11 Deletion

Test 11 involves the testing of the Process Computer and its programs. OD-11 is one of these programs and deals with the area of fuel pellet-clad interaction monitoring (Preconditioning Interim Operating Management Recommendations, PCIOMR). The program assists in implementing PCIOMR recommendations to prevent this type of fuel failure mechanism during operation. With barrier fuel, however, as used in Hope Creek, GE has removed the PCIOMR procedures from the operation plans since they are no longer needed. Thus, PSE&G has proposed the removal of the OD-11 test from the startup program. Our review has indicated that there is no need for PCIOMR monitoring for this fuel and the removal of this test is acceptable.

Test 16: TIP Uncertainty

Test 16 measures the Traversing Incore Probe (TIP) uncertainty, composed of geometry effects and random noise. These are determined by comparing symmetric pairs of TIP readings and repeated traverses of common TIP tubes. The criterion for first cycle TIP uncertainty tests is that it should be less than 6 percent. This is the value which if used in the uncertainty analyses for GETAB (rather than the 2.6 percent value normally used in first cycle) would increase the power density value sufficiently to increase the safety limit MCPR by 0.01. Previous tests in other reactors have always provided a TIP uncertainty well below 6 percent. Furthermore, the uncertainty is lower when using the recently introduced TIP gamma detector rather than the usual neutron detector since the gamma system is less sensitive to geometry errors. Thus PSE&G has proposed to delete the test.

TIP operability is determined in preoperational testing and during power ascension power distribution measurements and tests of the Process Computer. Previous tests in other reactors have indicated no problem in the TIP uncertainty area, and the gamma detectors have even lower uncertainty parameters. The Hope Creek system should be well below the criteria. The safe operation of the plant will not be affected by deleting this test. No changes to the Technical Specifications are required by this deletion. The proposed deletion of Test 16 is acceptable.

SALP INPUT FOR THE HOPE CREEK TEST CHANGES

1. Management Involvement

   The documentation presented with the proposed test changes request was satisfactory.

   Rating: Category 1

2. Resolution of Technical Issues

   The documentation showed a clear understanding of the technical issues involved.

   Rating: Category 1

3. Responsiveness to NRC Initiatives

   There were no NRC questions

   Rating: None