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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Gentlemen:

VOGTLE ELECTRIC GENERATING PLANT
GENERIC LETTER 89-10
CLOSE-OUT SUBMITTAL CLARIFICATION

Georgia Power Company (GPC) transmitted a Close-Out document to the NRC on January 31, 1996 to facilitate the closure of the Vogtle Electric Generating Plant (VEGP) Generic Letter 89-10 program. The document provided a detailed description of the program undertaken to implement the recommendations contained in the generic letter, as well as a discussion of the basis for justifying that each of the 256 valves included in the program is capable of performing its design-basis function.

Included in Volume 1 of the submittal is Table 10-1 entitled Post Close-Out Activities. This table identifies all of the modifications which were scheduled to be performed subsequent to the transmittal of the Close-Out document. In conjunction with the installation of these modifications during the spring 1996 outage, it was determined that certain modifications identified in this table could not be implemented as originally stated.

Specifically, the spring packs on valves 1HV-8508A/B and 1HV-8509A/B, the centrifugal charging pump miniflow valves, were not replaced. In conjunction with the implementation of the planned modification on the 1HV-8509A valve, it was determined that an acceptable valve setup could not be achieved with the new spring pack installed. The enclosure to this letter discusses the problems associated with the installation of the new spring pack and the basis for maintaining spring packs of the original configuration.

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In addition, it is anticipated that problems may be encountered relative to the implementation of similar modifications on the corresponding valves on Unit 2. The Unit 2 modifications are scheduled to be installed during the fall 1996 outage, and a determination of the feasibility of installing the spring pack modification on the 2HV-8508A/B and 2HV-8509A/B valves will be made at that time.

Should you require any additional information regarding this response, please contact my office.

Sincerely,

J. D. Woodard
Senior Vice President

JDW/HET/het

Enclosure

xc: Georgia Power Company
Mr. J. B. Beasley, Jr.
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U. S. Nuclear Regulatory Commission
Mr. S. D. Ebneter, Regional Administrator
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Enclosure

Valves 1/2HV-8508A/B & 1/2HV-8509A/B
Spring Pack 0301-112 versus 0301-113 Evaluation

In conjunction with the completion of Generic Letter 89-10 related upgrades at VEGP, valves 1HV-8508A/B and 1HV-8509A/B were scheduled for modifications during the spring 1996 outage. Valves 1HV-8508A/B and 1HV-8509A/B are Velan globe valves which are equipped with Limitorque SMB-00 operators with 10 ft-lb motors. The valves are installed in the Chemical and Volume Control System (CVCS) and are utilized in Centrifugal Charging Pump (CCP) miniflow applications. Valves 1HV-8508A/B were scheduled to have new motor pinion and worm shaft gears installed to increase the overall ratio, and a heavier spring pack installed to enable the torque switch setting to be increased. Valves 1HV-8509A/B were scheduled to have the heavier spring pack installed.

The afore mentioned modifications were installed on valve 1HV-8509A, and an attempt was made to setup the valve utilizing VOTES diagnostic equipment. It was determined that the heavy spring pack did not allow for a sufficiently low torque switch setting to enable the valve to be setup within its design window. In reviewing the test data it was determined that the actual stem factor for this valve was substantially better than the design stem factor which is based on a 0.15 stem friction coefficient. The better than design stem factor meant that less operator output torque was required to produce the required amount of valve thrust. In this particular case, the stem factor was such that the output torque of the operator could not be limited to a low enough value by the torque switch, with the heavy spring pack installed, to prevent the valve thrust from being outside the design range.

Valve 1HV-8509A was originally equipped with spring pack No. 0301-112. According to the Limitorque generic spring pack curves, this spring pack has a useable range of 115 ft-lb to 185 ft-lb. The original spring pack was replaced by spring pack No. 0301-113 in conjunction with the modifications. The useable range of the new spring pack is 170 ft-lb to 240 ft-lb according to Limitorque's generic data. As is apparent from reviewing the design ranges, there is very little overlap between the 112 spring pack and the 113 spring pack. Ideally, a spring pack with a useable range between that of the 112 and 113 spring packs would have been most appropriate for this application.

To resolve the problem with the 1HV-8509A valve, a 112 spring pack was reinstalled in the operator. The operator was subsequently setup within the design range utilizing VOTES diagnostic equipment. In anticipation of similar problems with the 1HV-8508A/B and the 1HV-8509B valves, the 113 spring packs were not installed in these valves. The new motor pinion and worm shaft gears were installed in the 1HV-8508A/B valves as originally planned. Each of these valves was also setup successfully utilizing VOTES test equipment. In reviewing the test data for these valves, it was noted, that in each case the actual stem factor was better than the design stem factor.

While the valves were successfully setup with the 112 spring packs installed, the use of this spring pack substantially impacts the valve margins included in Volume 2 of the Close-Out Submittal. The current analytical methodology considers the rating of the spring pack, in terms of thrust, and the resulting evaluations indicate that these valves are very marginal when evaluated based on the 112 spring pack rating. To illustrate this point the 1HV-8509A valve will be evaluated with both the 112 and 113 spring pack.

When determining the design window in the closing direction, a total of five potential limitations are considered in establishing the upper bound. Table 1 identifies those potential limitations and includes the applicable values for the 1HV-8509A valve assuming the 113 spring pack is installed.

Table 1
Valve 1HV-8509A

Closing Upper Bound Limitations	Thrust
Valve Allowable	33,326 lb
Operator Allowable (Thrust)	19,600 lb
Operator Allowable (Torque)	20,492 lb
Operator Spring Pack Rating	19,672 lb
Operator Reduced Voltage Capability	18,770 lb

The values presented in the table are in terms of thrust since this is the relevant unit with regard to establishing an acceptable valve setup in the field. The operator torque allowable and the spring pack rating are normally referenced in terms of torque, but for the purposes of this evaluation, have been converted to thrust by dividing by the design stem factor of 0.0122. As can be seen by reviewing the table, the limiting parameter for this valve is the operator reduced voltage capability of 18,770 lb.

The VEGP Close-Out Submittal includes a detailed discussion of the methodology utilized to determine capability margins and setup margins for torque switch controlled valves. Evaluating the 1HV-8509A valve based on this methodology, utilizing the 113 spring pack, results in calculated capability and setup margins of 75% and 29% respectively.

Performing a similar analysis with the 112 spring pack installed results in substantially different results. The maximum torque rating of the 112 spring pack is 185 ft-lb which is equivalent to 15,164 lb of thrust based on the design stem factor of 0.0122. In this case the spring pack rating replaces the operator reduced voltage capability as the upper limit with respect to closing the valve. Analyzing the valve based on the 112 spring pack

rating results in a Capability Margin of 42% and a Setup Margin of 4%. Based on the results of this analysis the valve appears to be very marginal with the 112 spring pack.

Table 2
Valve 1HV-8508A

Spring Pack	Capability Margin	Setup Margin
0301-113	75%	29%
0301-112	42%	4%

However, in the case of these valves, this analysis does not accurately reflect the actual capabilities. While there are limitations imposed by the spring pack on the capability of a torque switch controlled valve, the "nameplate" rating of the spring pack is not necessarily an accurate measure of those limitations. There are several reasons for this, including the following:

1. The actual useable range of a given size spring pack can vary substantially from the range identified in the Limitorque generic spring pack curves. With the advent of spring pack test equipment, such as the B&W test equipment utilized at VEGP, it is possible to evaluate each spring pack individually. By performing a spring pack test it is possible to develop a torque versus displacement curve for each individual spring pack which provides an accurate assessment of the spring packs actual range in terms of torque.

2. To utilize the spring pack rating in the calculations it is necessary to convert the torque rating to thrust. At VEGP this conversion is performed by dividing by the design stem factor which is based on a stem friction coefficient of 0.15. In practice, the actual stem friction coefficient is often significantly lower. Diagnostic testing allows the actual stem factor to be determined and in doing so provides an accurate assessment of the installed spring pack's actual capability in terms of thrust.

As a result of this review, the process for evaluating the margins of valves which are controlled by the torque switch in the closing direction will be revised. The spring pack rating will be excluded from the limitations which are considered when performing an analytical evaluation of valve margins. In the case of the 1HV-8509A valve, the calculated capability and setup margins with the 112 spring pack installed will be 75% and 29% respectively, which is equivalent to the margins calculated for the 113 spring pack. The actual spring pack capability will continue to be considered in conjunction with the valve setup. However, the setup will not be arbitrarily limited based on the

Limitorque spring pack torque rating and the theoretical conversion of this rating from torque to thrust.

If a valve is determined to be limited by the spring pack in conjunction with a valve setup, the spring pack can be replaced at that time to facilitate an acceptable setup. The spring pack will be replaced under the normal design change process with all of the associated controls including a 10 CFR 50.59 safety evaluation.

In summary, the spring pack is a mechanical device which is utilized in combination with a torque switch to control the torque output of an operator within a predetermined range. The spring pack limits operator capability only when it does not have sufficient range to allow for a torque switch setting which utilizes the capabilities otherwise inherent in the valve and operator. Torque switch limitations of this nature are readily apparent in conjunction with the valve setup process and can be easily resolved at that time. Including the Limitorque spring pack rating in analytical evaluations does not provide a realistic assessment of motor-operated valve capabilities.