January 9, 2001

MEMORANDUM TO: File

FROM: Jack N. Donohew, Senior Project Manager, Section 2 ***/RA/***
Project Directorate IV and Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: INFORMATION NEEDED TO CLARIFY CALLAWAY GENERIC LETTER 96-05 PROGRAM (TAC NO. M97027)

Attached are two e-mails. One e-mail is from the NRC staff that was sent to the licensee with questions on the licensee's submittal dated July 28, 1999, on the Callaway Generic Letter (GL) 96-05, "Periodic Verification of Design-Basis Capability of Safety-Related Power-Operated Valves," program . The second is the e-mail response from the licensee. The response from the licensee was discussed in the telephone conference call of December 18, 2000.

The purpose of the NRC staff's questions and the responses from the licensee was to clarify the licensee's submittal.

Docket No. 50-483

Attachments: 1. E-mail dated November 30, 2000
2. E-mail dated December 18, 2000

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OFFICIAL RECORD COPY

EMAIL DATED NOVEMBER 30, 2000

From: Thomas Scarbrough
To: Jack Donohew
Date: Thu, Nov 30, 2000 2:05 PM
Subject: Callaway GL 96-05 Program

Jack,

Following our inspection of the GL 96-05 program at Callaway in 1999, the licensee submitted a detailed table of valve specific data to support its position that, based on previous extensive dynamic testing under GL 89-10 at Callaway, future dynamic testing is not necessary if at least 25% capability margin is maintained. Attached is a list of discussion items from my review of the licensee's submittal.

I would appreciate it if you would set up a telephone conference with the MOV technical staff at Callaway to discuss these items.

At this time, my availability over the next couple of weeks is as follows:
December 4 and 5: all day
December 6: morning
December 8: afternoon
December 11-12: all day
December 13: afternoon
December 14-15: all day
December 18-21: all day

Thanks.
Tom

CC: David Terao, Mike Runyan, Steve Tingen

Attachment 1

DISCUSSION ITEMS FOR LICENSEE SUBMITTAL DATED JULY 28, 1999,
ON THE CALLAWAY GENERIC LETTER 96-05 PROGRAM

1. What are the licensee's plans regarding the use of a rate of loading (ROL) factor of 1 (rather than 1.15 or 1.2) for some motor-operated valves (MOVs)?

2. Has the licensee addressed recent industry information on dc motor actuator output?

3. Is the column labeled Reduced Voltage provided in terms of volts or ft lbs?

4. The licensee's table indicates that the Design Required Close thrust/torque is greater than the Measured MAT @ TST Close for BBPV8702B, EGHV0127, and EJHV8701A/B.

5. The licensee's table indicates that the Measured Pullout Thrust is greater than the Actuator Capacity Open thrust for EJFCV0610 and EMHV8802B, and nearly for EJHV8701A.

6. The licensee's table indicates that the Design Required Close thrust is greater than the Actuator Capacity Open thrust for EJHV8716B.

7. The licensee's table does not indicate a torque switch trip torque for Butterfly Valve ECHV0011.

8. The licensee's table indicates that the Measured MAT @ TST Close thrust/torque is greater than the Open Actuator Capacity for ALHV0007, BBHV8037B, BGHV8110, BGHV8357A, BNHV0003, EFHV0033, EFHV0034, EFHV0046, EFHV0049, EFHV0050, EJHV8811A/B, and EMHV8802A.

9. The licensee's table indicates that the Measured Pullout Thrust of 23000 lbs for EFHV0097 is much greater than other similar valves.

10. The licensee's table indicates that the Measured MAT @ LST Close value is greater than the Actuator Capacity Open for EJHV8804B, BNLCV0112E, and EJHV8716A.

11. The licensee's table indicates that the Measured Packing Load is greater than the Assumed Packing Load for BBHV8037A, BBHV8351A, BNHV8806A, BNHV8821B, EFPDV0019, EFPDV0020, EGHV0013, EGHV0133, EJHV8701B, EJHV8840, EMHV8802B, EMHV8803A/B, EMHV8821A, EMHV8835, EPHV8808D, and KCHV0253.

12. The staff evaluated the valve specific data provided by the licensee in support of its position that, based on extensive dynamic testing under GL 89-10, the GL 96-05 program at Callaway will provide adequate bounding margin without the need for future dynamic testing where 25% capability margin is maintained. Based on that review, the staff needs to discuss the following MOVs with the licensee:

Gate Valves: BBHV8000A/B, BBPV8702A/B, BGHV8106, BNLCV0112D/E, EFPDV0019, EGHV0059, EGHV0060, EGHV0127, EGHV0130, EGHV0131, EGHV0133, EJFCV0610, EJHV8701A/B, EJHV8716B, EJHV8804A/B, EMHV8801A/B, EMHV8802B, EMHV8803A/B, EMHV8835, ENHV0006, and ENHV0012.

Globe Valves: ALHV0007, ALHV0009, ALHV0011, BGHV8110, BGHV8111, BGHV8357B, and EMHV8814A.

Butterfly Valves: EFHV0025 and EFHV0037.

EMAIL DATED DECEMBER 18, 2000

From: "Shafer, David E" <DShafer@ameren.com>
To: "Donohew Jack (E-mail)" <jnd@nrc.gov>
Date: Mon, Dec 18, 2000 8:52 AM
Subject: FW: Telecon with NRC on 12/18

Jack, the attachment below is for our call this morning.

Dave Shafer

Phone 314-554-3104
Fax 314-554-3558
Email dshafer@ameren.com

> -----Original Message-----
> From: Brenner, Michael E.
> Sent: Friday, December 15, 2000 11:59 AM
> To: Shafer, David E
> Subject: FW: Telecon with NRC on 12/18
>
> Dave, Changed one sentence per our boss' request. Mike Brenner
>
> -----Original Message-----
> From: Brenner, Michael E.
> Sent: Thursday, December 14, 2000 3:33 PM
> To: Shafer, David E
> Subject: Telecon with NRC on 12/18
>
> David,
> We have a written response to the questions asked by Jack Donohew, NRC in
> electronic form. It would be much easier to talk with the NRC if they had
> a copy in hand. Let me know if you agree. The information is attached.
> It is not an official transmission. Info. only. <<RAI 96-05 Discussion
> Items.doc>>
>
> Thanks,
> Mike Brenner/ Jason Bruemmer

DISCUSSION ITEMS FOR LICENSEE SUBMITTAL DATED JULY 28, 1999,
ON THE CALLAWAY GENERIC LETTER 96-05 PROGRAM

1. What are the licensee's plans regarding the use of a rate of loading (ROL) factor of 1 (rather than 1.15 or 1.2) for some motor-operated valves (MOVs)?

   ANSWER:

   A rate of loading of 1.15 or 1.2 is more conservative than a rate of loading of 1. At this time, Callaway has no intention of removing conservatism from it's calculations by going to a rate of loading of 1.

2. Has the licensee addressed recent industry information on dc motor actuator output?

   ANSWER:

   Yes. Callaway Plant uses an Application Factor of 0.75 with the exception of FCHV0312 at 0.90. These values are very conservative relative to current industry values.

3. Is the column labeled Reduced Voltage provided in terms of volts or ft lbs?

   ANSWER:

   The column labeled reduced voltage is given in terms of volts. This data is the single phase reduced voltage term used in Callaway's reduced voltage calculation. The reason that the reduced voltage data looks low when compared to Rated Voltage is that Rated Voltage is a 3 phase voltage while the reduced voltage data is single phase.

4. The licensee's table indicates that the Design Required Close thrust/torque is greater than the Measured MAT @ TST Close for BBPV8702B, EGHV0127, and EJHV8701A/B.

   ANSWER:

   BBPV8702B and EJHV8701A/B are soft-seated valves. The torque switch is bypassed in the closed direction until the valve contacts the seat. As a result, the full capacity of the actuator is available to close the valve against design DP and the torque switch can be set up to trip at a torque lower than would normally be required to overcome design DP. A seating thrust target of 28,065 lbs. is used for these valves.

   At the time RAI 96-05 was submitted, EGHV0127 was not capable of being set up to meet it's Design Required Close Thrust. This condition was considered acceptable due to the fact that this valve only has a safety function to close when it is opened during power operations. EGHV0127 is normally locked in the closed position during power operation. Administrative controls also exist which prevent EGHV0127 from being opened at power unless all design requirements are met or an equipment operator is stationed at the valve in communication with the control room so that the valve can be manually closed upon a containment isolation signal. EGHV0127 has recently had a stiffer spring pack installed and been retested. The MAT @ TST is currently 13,558 lbs., which is greater than the Design Required Close Thrust.

EGHV0127 is also scheduled to have it's motor gear set ratio changed. This will increase the actuator capacity and allow EGHV0127's thrust margin to be increased from 23.27% to above 25%.

5. The licensee's table indicates that the Measured Pullout Thrust is greater than the Actuator Capacity Open thrust for EJFCV0610 and EMHV8802B, and nearly for EJHV8701A.

ANSWER:

All three of these valves are acceptable according to the criteria Callaway uses to determine the capability of a valve to open. Callaway requires that the Measured Pullout Torque be less than the Allowable Reduced Voltage Pullout Torque. Actuator Capacity OPEN and Pullout Thrust are calculated sets of data developed for the purposes of RAI 96-05. They are not normally compared at Callaway to assess a valves capacity to open.

EJFCV0610 is a limit switch controlled valve with the torque switch jumpered out of the circuit in the closed direction. The closed limit switch is set up to trip after the flow cut off point but before the valve hits the seat. Since the valve does not seat, the actual pullout thrust is 0 lbs. This was verified to be correct from past test data. The pullout thrust provided in RAI 96-05 is the pullout thrust the valve would see if the torque switch was used as the closure control. This value is not applicable as long as the torque switch remains jumpered.

The pullout thrust provided in the RAI for EJHV8701A is from the last time a TTC was installed on this valve. A more recent test performed with a Torque Switch Transducer (TST) verified that the pullout thrust is now much less than 41,164 lbs. In fact, the pullout thrust is now below the pre-load of the TST. As a result, the pullout thrust is assumed to be the TST pre-load value of 27,094 lbs. The large change in pullout thrust is believed to be a result of the replacement of the valve's Body to Bonnet Gasket. The high pullout thrust was probably due to the stem and valve bonnet being slightly out of alignment causing the valve disk to be cocked as it went into the seat. Replacing the Body to Bonnet Gasket probably provided the extra benefit of realigning the bonnet and stem resulting in a normal amount of pullout thrust.

EMHV8802B's pullout thrust was determined to not actually be 12,222 lbs. This value was actually calculated using the pullout torque and measured stem factor from the MOVATS test performed in 1998. The actual pullout thrust obtained from the MOVATS test signature was 7,583 lbs. EMHV8802B also had a Body to Bonnet Gasket replacement and MOVATS test performed in 1999 after RAI 96-05 was submitted. This test revealed a pullout torque of 39.38 ft-lbs. and a pullout thrust of 3,694 lbs. As was the case for EJHV8701A, the replacement of the Body to Bonnet Gasket appears to be responsible for the decrease in pullout thrust and torque.

6. The licensee's table indicates that the Design Required Close thrust is greater than the Actuator Capacity Open thrust for EJHV8716B.

ANSWER:

Actuator Capacity OPEN was calculated by dividing the Allowable Reduced Voltage Pullout Torque by the stem factor corresponding to a coefficient of friction of 0.2. However, Callaway's standard coefficient of friction is actually 0.15. If Actuator Capacity OPEN is recalculated using a stem factor at a coefficient of friction of 0.15, it becomes 22,793 lbs. and the condition described in this discussion item no longer exits EJHV8716B.

Also, EJHV8716B has always been acceptable according to the criteria Callaway uses to determine the capability of a valve to open. Callaway requires that the Measured Pullout Torque be less than the Allowable Reduced Voltage Pullout Torque. Actuator Capacity OPEN is a calculated set of data developed for the purposes of RAI 96-05. It is not used at Callaway to assess a valve's capacity to open.

7. The licensee's table does not indicate a torque switch trip torque for Butterfly Valve ECHV0011.

ANSWER:

The value for MAT @ TST (CLOSE) for ECHV0011 is 307 ft. lbs. In addition the close torque switch for ECHV0011 has been bypassed, changing the close circuitry to close on limit without a torque switch in the circuit. (DRO)

8. The licensee's table indicates that the Measured MAT @ TST Close thrust/torque is greater than the Open Actuator Capacity for ALHV0007, BBHV8037B, BGHV8110, BGHV8357A, BNHV0003, EFHV0033, EFHV0034, EFHV0046, EFHV0049, EFHV0050, EJHV8811A/B, and EMHV8802A.

ANSWER:

Actuator Capacity OPEN was calculated by dividing the Allowable Reduced Voltage Pullout Torque by the stem factor corresponding to a coefficient of friction of 0.2. However, Callaway's standard coefficient of friction is actually 0.15. If Actuator Capacity OPEN is recalculated using a stem factor at a coefficient of friction of 0.15, the condition described in this discussion item no longer exits for ALHV0007, BBHV8037B, BGHV8110, BGHV8357A, BNHV0003, EJHV8811A/B, and EMHV8802A.

Also, ALHV0007, BBHV8037B, BGHV8110, BGHV8357A, BNHV0003, EJHV8811A/B, and EMHV8802A have always been acceptable according to the criteria Callaway uses to determine the capability of a valve to open. Callaway requires that the Measured Pullout Torque be less than the Allowable Reduced Voltage Pullout Torque. Actuator Capacity OPEN is a calculated set of data developed for the purposes of RAI 96-05. It is not used at Callaway to assess a valve's capacity to open.

EFHV0033, EFHV0034, EFHV0046, EFHV0049, and EFHV0050 are all butterfly valves with their torque switches jumpered out of the circuit in the closed direction. Therefore, it is MAT @ LST that is the crucial data not MAT @ TST. MAT @ LST is below Actuator Capacity OPEN for all five of these valves. Also, all five valves have a Measured Pullout Torque well below the Allowable Reduced Voltage Pullout Torque, which satisfies the criteria Callaway uses to determine a valve's capability to open.

9. The licensee's table indicates that the Measured Pullout Thrust of 23000 lbs for EFHV0097 is much greater than other similar valves.

ANSWER:

The value for 'Measured Pullout Thrust is calculated by dividing the measured Pull Out Torque by the measured Stem Factor. Investigation of the measured stem factor indicated a

typographical error (misplaced decimal point). Using the corrected value changes the Measured Pullout Thrust to 2242 vs. 23000. (DRO)

10. The licensee's table indicates that the Measured MAT @ LST Close value is greater than the Actuator Capacity Open for EJHV8804B, BNLCV0112E, and EJHV8716A.

ANSWER:

EJHV8804B, BNLCV0112E, and EJHV8716A are acceptable according to the criteria that Callaway uses to determine the capability of a valve to open. All three valves have a Measured Pullout Toque well below the Allowable Reduced Voltage Pullout Torque. Actuator Capacity OPEN is a calculated set of data developed for the purposes of RAI 96-05. It is not used at Callaway to assess a valve's capacity to open.

11. The licensee's table indicates that the Measured Packing Load is greater than the Assumed Packing Load for BBHV8037A, BBHV8351A, BNHV8806A, BNHV8821B, EFPDV0019, EFPDV0020, EGHV0013, EGHV0133, EJHV8701B, EJHV8840, EMHV8802B, EMHV8803A/B, EMHV8821A, EMHV8835, EPHV8808D, and KCHV0253.

ANSWER:

All MOVs with a field measured running load greater than the assumed, EPRI calculated packing load have been evaluated to ensure operability plus margin at design basis conditions and are satisfactory as-is. Packing replacement has been planned and scheduled for MOVs to improve margin when necessary.

MOV	Assumed Packing Load (lbf)	Measured Packing Load (lbf)	PPR Date/ Verified	Corrective Maintenance Document	Measured Packing Load (lbf) as of 12/7/00	Corrective Maintenance Status
BBHV8037A	1500	1586	Verified	W200617	1586	11/1/05
BBHV8351B	1500	1654	Verified	W207227	1654	Pending
BNHV8806A	1500	1532	Verified	R189387A	405	Complete
BNHV8812B	2500	2882	Verified	W168034	2882	10/6/04
EFPDV0019	1500	1750	Verified	W199329	1750	4/17/01
EFPDV0020	1500	1622	Verified	W176013	1622	5/1/01
EGHV0013	1000	1170	Verified	W207230	1170	Pending
EGHV0133	1500	2058	10/20/99	P610144	1058	Complete
EJHV8701B	4000	5901	Verified	P516065	5901	Pending
EJHV8840	2500	8798	10/22/99	W200622	9079	4/16/01
EMHV8802B	1500	1966	Verified	W200621	1966	5/1/04
EMHV8803A	1500	2976	9/28/00	W207229	2976	Pending
EMHV8803B	1500	1600	Verified	W194789	1600	4/12/01
EMHV8821A	1500	3165	Verified	W200608	3165	5/1/04
EMHV8835	1500	1504	10/13/99	P416875	599	Complete
EPHV8808D	2500	3390	10/9/99	W194823	2818	5/1/01
KCHV0253	1500	2189	Verified	W207228	2189	Pending

12. The staff evaluated the valve specific data provided by the licensee in support of its position that, based on extensive dynamic testing under GL 89-10, the GL 96-05 program at Callaway will provide adequate bounding margin without the need for future

dynamic testing where 25% capability margin is maintained. Based on that review, the staff needs to discuss the following MOVs with the licensee:

Gate Valves: BBHV8000A/B, BBPV8702A/B, BGHV8106, BNLCV0112D/E, EFPDV0019, EGHV0059, EGHV0060, EGHV0127, EGHV0130, EGHV0131, EGHV0133, EJFCV0610, EJHV8701A/B, EJHV8716B, EJHV8804A/B, EMHV8801A/B, EMHV8802B, EMHV8803A/B, EMHV8835, ENHV0006, and ENHV0012.

Globe Valves: ALHV0007, ALHV0009, ALHV0011, BGHV8110, BGHV8111, BGHV8357B, and EMHV8814A.

Butterfly Valves: EFHV0025 and EFHV0037.