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U-602284
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Docket No. 50-461

Document Control Desk
Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Illinois Power's (IP's) Submittal of Additional Information for the Requested Extension to Generic Letter (GL) 89-10 Activities

Dear Sir:

This letter submits additional information for a schedule extension of Clinton Power Station's (CPS's) GL 89-10 activities. This additional information was requested in an NRC letter dated February 28, 1994. The information requested was also discussed during a February 24, 1994, teleconference among R. L. Hague and C. A. Gainty (NRC Region III); T. G. Scarbrough, D. V. Pickett, et al (NRR); and R. F. Phares, J. A. Puzauskas, et al (IP). This information was requested prior to the NRC granting an extension of the completion date for CPS's GL 89-10 Program. The requested extension will be from June 28, 1994, to the end of the sixth refueling outage (RF-6), scheduled to begin in October 1996.

The additional information requested for extension approval is provided in Attachment 2. On the basis of this information and IP's initial letter (U-602225), sent January 13, 1994, IP believes it is acceptable to extend the GL 89-10 requirements through RF-6. If there are any questions regarding this submittal, please contact us. Attachment 1 provides an affidavit supporting the facts set forth in this letter and its attachments.

Sincerely yours,

J. G. Cook
Vice President

JSP/csm

Attachments

cc: NRC Clinton Licensing Project Manager
NRC Resident Office, V-690
Regional Administrator, Region III, USNRC
Illinois Department of Nuclear Safety

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Attachment 1
to U-602284

J. G. Cook, being first duly sworn, deposes and says: That he is Vice President of the Nuclear Program at Illinois Power; that this letter supplying additional information for the Generic Letter 89-10 extension has been prepared under his supervision and direction; that he knows the contents thereof; and that to the best of his knowledge and belief said letter and the facts contained therein are true and correct.

Date: This 6 day of May 1994.

Signed: J. G. Cook

STATE OF ILLINOIS } SS.
DeWitt COUNTY }

Subscribed and sworn to before me this 6th day of May 1994.

"OFFICIAL SEAL"
Jacqueline S. Matthias
Notary Public, State of Illinois
My Commission Expires 11/24/97

Jacqueline S. Matthias
(Notary Public)

Listed below is a synopsis of the questions contained in NRC letter dated February 28, 1994, and discussed during a February 24, 1994 teleconference and the information required to fully answer them.

NRC Question 1:

Which of the 70 Motor Operated Valves (MOVs) for which this extension is requested need to be extended to RF-6?

IP Response:

Listed below are tables describing which MOVs are scheduled for RF-6, MOVs scheduled for RF-6 that have the potential to be rescheduled for RF-5, and MOVs scheduled for RF-5 that have the potential to be rescheduled for RF-6. This latitude is required to provide flexibility in outage scheduling so that a single MOV such as 1B21F067A (outboard main steam isolation valve [MSIV] above seat drain valve) would not force a considerable extension to RF-5 if scheduling constraints became an issue within RF-5.

MOVs to be Completed in RF-6

VALVE EQUIPMENT ID NUMBER (EIN)	DESCRIPTION	VALVE SIZE	AS-LEFT VS. REQUIRED THRUST		Valve ΔP (psi)
			Required Minimum Thrust (lbs)	As-left Minimum Thrust (lbs)	Includes water hammer
	Globe				
1E32F002J	MSIV LEAKAGE CONTROL SYSTEM INBOARD VALVE	1.5"	1,000	9,510	25
1E32F002N	MSIV LEAKAGE CONTROL SYSTEM INBOARD VALVE	1.5"	1,000	6,536	25
1E32F003A	MSIV LEAKAGE CONTROL SYSTEM INBOARD DEPRESSURIZATION VALVE	1.5"	1,000	6,635	25
1E32F003E	MSIV LEAKAGE CONTROL SYSTEM INBOARD DEPRESSURIZATION VALVE	1.5"	1,000	8,566	25
1E32F003J	MSIV LEAKAGE CONTROL SYSTEM INBOARD DEPRESSURIZATION VALVE	1.5"	1,000	8,633	25
1E32F003N	MSIV LEAKAGE CONTROL SYSTEM INBOARD DEPRESSURIZATION VALVE	1.5"	1,000	9,164	25
	Gate (Flex Wedge)				
1E32F006	MSIV LEAK CONTROL SYSTEM OUTBOARD BLEED VALVE	2.5"	768	4,242	25
1E32F007	MSIV LEAK CONTROL SYSTEM OUTBOARD BLEED VALVE	2.5"	768	4,387	25
1E32F008	MSIV LEAK CONTROL SYSTEM OUTBOARD DEPRESSURIZATION VALVE	2.5"	762	3,664	22
1E32F009	MSIV LEAK CONTROL SYSTEM OUTBOARD DEPRESSURIZATION VALVE	2.5"	762	5,069	22

MOVs to be Completed in RF-6 with the Potential to be Rescheduled for RF-5

	Globe				
1E32F001A	MSIV LEAKAGE CONTROL SYSTEM INBOARD VALVE	1.5"	1,000	6,489	25
1E32F001J	MSIV LEAKAGE CONTROL SYSTEM INBOARD VALVE	1.5"	1,000	9,440	25
1E32F001N	MSIV LEAKAGE CONTROL SYSTEM INBOARD VALVE	1.5"	1,000	7,660	25
1E32F002E	MSIV LEAKAGE CONTROL SYSTEM INBOARD VALVE	1.5"	1,000	6,887	25

MOVs to be Completed in RF-5 with the Potential to be Rescheduled for RF-6

VALVE EIN	DESCRIPTION	VALVE SIZE	AS-LEFT VS. REQUIRED THRUST		Valve ΔP (psi)
			Required Minimum Thrust (lbs)	As-left Minimum Thrust (lbs)	Includes water hammer
	Globe				
1B21F067A	OUTBOARD MSIV ABOVE SEAT DRAIN VALVE	1.5"	3,625	8,040	1190
1B21F067B	OUTBOARD MSIV ABOVE SEAT DRAIN VALVE	1.5"	3,625	8,693	1190
1B21F067C	OUTBOARD MSIV ABOVE SEAT DRAIN VALVE	1.5"	3,625	7,895	1190
1B21F067D	OUTBOARD MSIV ABOVE SEAT DRAIN VALVE	1.5"	3,625	7,714	1190

NRC Question 2:

The licensee's submittal should provide more information justifying that the valve factor, the diameter used in calculations/evaluations, stem friction coefficient and packing load assumed are appropriate. Discuss the applicability of the Electric Power Research Institute (EPRI) test data on globe valves to its valve factor assumptions. Which butterfly valves will need an extension past June 28, 1994?

IP Response:

Valve Factor - Page two, Paragraph two, of NRC Generic Letter 89-10, Supplement 6, states, "As a minimum, the staff expects all licensees to have their valves set up with the best available industry data by the original completion date accepted by the staff, whether or not all testing has been completed." Early in 1993, during preparation for the fourth refueling outage that began in September 1993, IP recognized that the GL 89-10 requirements for all MOVs could not be completed by June 1994. At that time, IP selected the assumptions to be used in evaluating the capability of MOVs based on available Clinton-specific and industry information. IP ensured that safety-significant MOVs, as determined by the probabilistic risk assessment (PRA), as well as low safety-significant MOVs that did not have margin to meet the selected assumptions, would be completed prior to June 28, 1994. Additionally, those valves that could be completed during non-outage periods were also scheduled for completion prior to June 28, 1994. This left 70 low safety-significant MOVs that were planned for extension to subsequent refueling outages.

Based on the information at that time, the selection of a 0.5 valve factor for final setting of Anchor Darling (A/D) gate valves was believed to be a bounding value for all MOVs except those with significant hardware problems. The selection of a 0.45 valve factor was believed to be a nearly bounding value that would be reasonable for interim settings for the population of the low safety significant valves that would be extended to the fifth and sixth refueling outages to complete final settings. (Note: Low safety-significant MOVs collectively contribute less than 0.01% of the MOV contributions to core damage frequency and failure to isolate containment, and provide for containment heat removal, containment venting, and containment/reactor pressure vessel flooding.)

Since that time, IP has completed dynamic testing of 18 A/D gate valves with resulting closing valve factors ranging from 0.14 to 0.84, with an average closing valve factor of 0.49 based on the highest recorded thrust, up to and including hard seat contact. IP has carefully reviewed these test results and determined that 0.45 is still a reasonable valve factor for interim setting of low safety-significant valves. This chosen valve factor is high enough that it covers the range of A/D gate valves as long as the valve internal condition is good. The higher

valve factors obtained were attributed to the particular valve internal condition, not the specific group of valves (e.g., size, pressure class, etc.). For valves in good internal condition, 0.45 is a nearly bounding value for closing valve factor. This value is also supported by the EPRI test results for A/D gate valves that show an average closing valve factor of 0.44 based on the highest measured thrust, up to and including hard seat contact.

IP maintains that the use of a 0.45 valve factor is appropriate for the interim period of the extension. In addition to the low safety significance of the valves and the test data discussed above, the probability of the occurrence of an accident during this brief period, coincident with the conditions that would result in these valves experiencing their maximum differential pressure, is very low.

Diameter used in calculations/evaluations - CPS uses the mean seat diameter for actuator sizing and switch setting calculations. The mean seat diameter is also used to calculate valve factors from data obtained during CPS dynamic testing.

Stem friction coefficient - The average stem friction coefficient obtained during dynamic testing at CPS is below 0.15. The 0.18 value used in the evaluation provides conservative estimates of the actuator, motor, and valve torques associated with the as-left thrust values.

Packing load assumption - CPS test data shows that the average packing load for CPS valves is approximately 40% of standard packing load assumptions provided in the Limitorque sizing criteria (SELs). Therefore, the 70% assumption used for the interim reasonable-assurance evaluation is conservative.

EPRI test data on globe valves - A 1.1 valve factor was used in this evaluation for globe valves. IP's test data supports a 1.1 valve factor. All but two of the globe valves for which this extension is requested have more than twice the calculated minimum required thrust. The two that do not (1E12F037A and 1E12F037B) are closed and are in their safe position during normal plant operation. Therefore, reasonable-assurance exists for all globe valves for this interim evaluation. IP is aware of EPRI globe valve testing efforts and will continue to review EPRI's results for impact on IP's GL 89-10 switch setting calculations.

Butterfly valves - This extension request did not include butterfly valves as IP intends to complete butterfly valves to GL 89-10 requirements by June 28, 1994.

NRC Question 3:

The licensee should discuss more specifically its assumptions in determining degraded voltage capability of the extended-schedule MOVs.

IP Response:

The degraded voltage methodology used for GL 89-10 actuator sizing and switch setting calculations is listed below:

- The application factor is set at 0.9. This value is specified in the Limitorque SELs.

- The available voltage during valve operation would be the minimum voltage identified in CPS degraded voltage calculations.

- The motor torque is reduced by the square of the voltage when the available voltage drops below 100%.

- Motor torque is based on rated name plate torque.

The degraded voltage methodology used for this interim, reasonable-assurance evaluation is listed below:

- The application factor is set equal to 1.0. Limitorque permits a 1.0 application factor for evaluation purposes. In addition, Limitorque Technical Update 93-03 indicates that use of a 1.0 application factor is allowable when voltage is degraded from 100%.

- The available voltage during valve operation would be the minimum voltage identified in CPS degraded voltage calculations.

- The motor torque is reduced by the square of the voltage when the available voltage drops below 100%.

- Motor torque is based on rated name plate motor torque.

  - The torque switch settings for some valves were above rated motor torque at degraded voltage conditions. This was considered acceptable, provided that the minimum required thrust is supplied at the degraded voltage condition and the valve has no active opening safety function.

  - Seven MSIV Leakage Control system valves had torque switch settings above rated motor torque at degraded voltage conditions (1E32-F006, 1E32-F009, 1E32-F001J, 1E32-F002J, 1E32-F003E, 1E32-F003J and 1E32-F003N). In addition, the switch settings for two of these valves were above motor stall torque at degraded conditions. These seven MOVs were considered acceptable because the minimum required thrust is provided at the degraded voltage condition and it is unlikely that these valves would be required to be reopened once they are closed.

Note: All DC MOVs have been completed (extension request does not include DC MOVs).

NRC Question 4:

The licensee should provide justification for not including diagnostic inaccuracy. This justification is limited to those MOVs whose thrust setting is less than 25% above the minimum thrust requirements per discussion during the February 24, 1994, teleconference.

IP Response:

This evaluation is for an interim period until such time as the actuator switches can be readjusted in RF-5 or RF-6 to current switch setting criteria which accounts for potential diagnostic inaccuracy. On the basis of the February 24, 1994, teleconference, 60 of the 70 MOVs for which this extension is requested are acceptable

because the measured thrust is at least 25% greater than the minimum required thrust. The ten MOVs listed below have adequate margin for the interim period until RF-5, which is scheduled to begin in March 1995. Justification of acceptability, with a margin less than 25%, for the required nine-month extension period is included with each of the ten MOVs (including 1CC127 discussed below).

Note: A minor error was found in the Component Cooling Water (CC) differential pressure calculation since the original reasonable-assurance evaluation. As a result, one additional MOV (1CC127) was identified with less than a 25% margin, and the remainder of the CC MOV margins decreased slightly.

1CC054 - Outboard CC Containment Isolation Valve

PRA analysis determined that the worst-case scenario used to develop the CC differential pressure (dP) calculation was not credible. This scenario did not take credit for the motor operated valves located upstream of 1CC054 having shorter stroke times. As such, the upstream MOVs will close prior to 1CC054. The dP calculation will be revised with an appropriate credible scenario which will result in the setpoint for this valve having greater than 25% margin.

1CC049 - Outboard CC Containment Isolation Valve

PRA analysis determined that the worst-case scenario used to develop the CC dP calculation was not credible Reanalysis using a credible worst-case scenario will reduce the dP such that the as-left switch setting will have greater than 25% margin. The dP calculation will be revised accordingly.

1CC060, 1CC127 and 1CC128 - Inboard CC Containment Isolation Valves

The original evaluation did not take credit for flow through other flow paths such as fuel pool cooling, auxiliary boiler and other smaller alternate paths. In reality, flow will always be present through these paths when the system is in service. When credit is taken for these alternate flow paths, the differential pressure across these valves is reduced and the current setpoint provides greater than 25% margin. The differential pressure calculation will be revised to take credit for flow through these alternate flow paths.

1E12-F028A - Inboard Containment Spray Isolation Valve

The thrust value for this MOV was measured using a VOTES calibrator clamp as an auxiliary sensor during RF-3 and has an overall potential inaccuracy of 9.2% including torque switch repeatability and torque correction factor (TCF). This MOV has adequate margin in the opening direction. The motor has capability to close the valve, but the existing torque switch setting provides less than a 9.2% margin. However, reasonable-assurance of the MOV functioning for this interim period is provided below.

This valve has two closing safety functions: 1) isolate containment, and 2) divert Low Pressure Coolant Injection (LPCI) flow to the reactor when containment spray is terminated.

1) The containment isolation function will be met because the valve is normally closed. The only time it is opened during plant operation is for quarterly stroke time testing. Consideration of an accident requiring containment isolation during stroke time testing is not credible based on the short time that the MOV is out of position.

2) The valve has adequate capacity to perform its second safety function of diverting flow to the reactor. The limit switch will remain in the circuit until the valve is essentially closed (valve stroke time is 74 seconds and the limit switch remains in the closing circuit until the last 200 to 1000 milliseconds of stem travel). At this point, the valve will be sufficiently closed to ensure that flow is diverted back to the reactor.

1E12-F028B - Inboard Containment Spray Isolation Valve

The thrust value for this MOV was measured using a VOTES calibrator clamp as an auxiliary sensor during RF-3 and has an overall potential inaccuracy of 9.2% including torque switch repeatability and TCF. The current 13.5% switch setting margin envelops the 9.2% potential inaccuracy.

1FP079 - Inboard Drywell Isolation Valve

The original assumption for 1FP079 thrust requirements is no longer appropriate due to modification FP-087 installed during RF-4. This modification changed the position of the upstream isolation valve to closed during normal plant operation. As a result, this valve will have little or no dP to close against, and the existing switch setting will provide greater than 25% margin. Additionally, a design change to maintain this valve in a normally-closed position will be issued. At that time, this MOV will be deleted from the GL 89-10 scope since it would no longer have an active safety function.

1VP004A - Outboard VP Containment Isolation Valve

The thrust value for this MOV was measured using a VOTES calibrator clamp as an auxiliary sensor during RF-3 and has an overall potential inaccuracy of 9.3% including torque switch repeatability and TCF. The current 8.7% switch setting margin is considered acceptable for this interim reasonable-assurance evaluation.

1E12-F037B - Inboard Residual Heat Removal (RHR) Containment Isolation Valve

The safety function of this valve is to close to provide containment isolation. This containment isolation function will be met because the valve is normally closed during plant operation. The only time it is opened is for quarterly stroke time testing. Consideration of an accident requiring containment isolation during stroke time testing is not credible based on the short time that the MOV is out of position. Therefore, since the MOV will be out of its safety position for only a short time and there exists a 23% margin, reasonable-assurance exists that this MOV will function.

NRC Question 5:

The licensee's submittal does not justify that its planned method for periodic verification will ensure that safety-related MOVs continue to be capable of performing their design-basis safety function.

IP Response:

Illinois Power understands that approval of this request for extension is not to be construed or interpreted as approval of IP's method for periodic verification that safety-related MOVs continue to be capable of performing their design-basis safety function.

ADDENDUM TO ORIGINAL LETTER , U-602225

As described in IP's original letter requesting an extension to GL 89-10 activities (U-602225), dated January 13, 1994, IP has continued to review the MOVs within our program to determine if IP's identified MOV scope is consistent with the Generic Letter and its supplements. Subsequently, IP has determined that eight MOVs contained in the original extension request meet the requirements of "position-changeable" as defined in Supplement 4 to Generic Letter 89-10 and will be deleted from the 89-10 scope. These valves are listed below:

VALVE EIN	DESCRIPTION
	Gate (Flex Wedge)
1E12F006A	RHR SHUTDOWN COOLING SUCTION VALVE
1E12F006B	RHR SHUTDOWN COOLING SUCTION VALVE
1E21F001	LOW PRESSURE CORE SPRAY SUCTION FROM SUPPRESSION POOL VALVE
	Globe
1E51F076	REACTOR CORE ISOLATION COOLING STEAM LINE WARM-UP INBOARD ISOLATION VALVE
1VQ006A	CONTAINMENT BUILDING EXHAUST OUTBOARD ISOLATION BYPASS VALVE
1VQ006B	CONTAINMENT BUILDING EXHAUST INBOARD ISOLATION BYPASS VALVE
1VR002A	CONTAINMENT BUILDING VENTILATION SUPPLY OUTBOARD ISOLATION VALVE
1VR002B	CONTAINMENT BUILDING VENTILATION SUPPLY INBOARD ISOLATION VALVE

Additionally, these reviews determined that two MOVs that were previously deleted from the 89-10 scope were evaluated incorrectly. These MOVs have been added back to the GL 89-10 scope and are therefore included in IP's extension request for RF-5. Listed below are valve equipment identification number, MOV description, valve size, the required minimum actuator thrust, the as-left actuator thrust, the pressure drop across the valve (ΔP) and the design basis safety function during accident conditions.

VALVE EIN	DESCRIPTION	VALVE SIZE	AS-LEFT VS. REQUIRED THRUST		Valve ΔP (psi)	Close (C), Open (O) Both (B)
			Required Minimum Thrust (lbs)	As-left Minimum Thrust (lbs)	Includes water hammer	Safety Direction
	GATE (Flex Wedge)					
1G33F028	REACTOR WATER CLEANUP TO CONDENSER INBOARD ISOLATION VALVE	4.0"	6,023	8,554	750	C
1G33F034	REACTOR WATER CLEANUP TO CONDENSER OUTBOARD ISOLATION VALVE	4.0"	6,023	7,843	750	C

The dP calculated for these valves prior to removing them from the GL 89-10 program was 1085 psi. However, this calculation took no credit for the four containment isolation valves located upstream of 1G33F028 (F028) and 1G33F034 (F034). As such, no credit was taken for the reduction of dP that these MOVs would provide to F028 and F034. Inservice inspection (ISI) and valve diagnostic test data determined that the stroke times for the upstream valves are one to one and one-half seconds faster than F028 and F034. In addition, two of the upstream valves have a smaller flow capacity (a lower C_V). Therefore, the upstream valves will reduce the dP across F028 and F034. Analysis of these conditions indicates that the dP across F028 and F034 will be less than 750 psi. Since the existing switch settings provide for greater than 25% margin at 750 psi, reasonable-assurance that F028 and F034 will function for this interim period has been established.

In conclusion, with the addition of the two reactor water cleanup MOVs and deletion of the above eight, the total number of MOVs for which an extension is requested is revised to 64.