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ILLINOIS POWER

U-602303
L47-94(06-20)LP
8E.100a
JGC-126-94
June 20, 1994

Docket No. 50-461

10CFR50.90

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

Subject: Clinton Power Station Proposed Amendment of Facility Operating License No. NPF-62 (LS-94-011)

Dear Sir:

Illinois Power (IP) hereby requests a change to Clinton Power Station (CPS) Technical Specification 3/4.4.3.1, "Reactor Coolant System Leakage-Leakage Detection Systems." This change is being proposed in response to the inoperability of the drywell floor drain sump flow rate monitoring instrumentation. As documented in the attachment to this letter, IP made a similar request in February 1994 (IP letter U-602257 dated February 25, 1994, as supplemented by IP letter U-602265 dated March 11, 1994). The NRC reviewed that request and issued a one-time change to the Technical Specification as Amendment No. 89. Recent inconsistent drywell floor drain sump flows indicate that subsequent work performed on the system during a maintenance outage in April has apparently not fully resolved the instrumentation problem. This proposed change would again allow continued plant operation until the next time the plant is required to be brought to COLD SHUTDOWN, at which time the drywell can be safely accessed to effect repairs on the instrumentation.

For the proposed Technical Specification change, a description and the associated justification (including a Basis For No Significant Hazards Consideration) are provided in Attachment 2. Marked-up copies of pages from the current Technical Specifications are provided in Attachment 3. In addition, marked-up copies from IP's request to adopt the Improved Standard Technical Specifications (IP letter U-602196 dated October 26, 1993) are provided in Attachment 4, reflecting the proposed change. Further, an affidavit supporting the facts set forth in this letter and its attachments is provided in Attachment 1.

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IP has reviewed the proposed change against the criteria of 10CFR51.22 for categorical exclusion from environmental impact considerations. The proposed change does not involve a significant hazards consideration, or significantly increase the amounts or change the types of effluents that may be released offsite, nor does it significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, IP concludes that the proposed change meets the criteria given in 10CFR51.22(c)(9) for a categorical exclusion from the requirement for an Environmental Impact Statement.

The subject drywell floor drain sump flow monitoring subsystem was declared inoperable at 1800 hours on June 10, 1994. This condition requires entry into an Action Statement which requires the plant to be shut down in 30 days if the system cannot be restored to OPERABLE status. As identified in Attachment 2 to this letter, IP is currently working on all possible avenues to restore this instrumentation to OPERABLE status with the plant in operation. However, based on previous experience with this instrumentation it is expected that the problems will not be corrected without work on the weir and the probe. Therefore, further corrective actions will require access to the drywell and to the floor drain weir box located under the reactor vessel. Due to the high temperatures and radiation levels that exist in this area during plant operation, and due to the high temperatures that continue to exist in the area of the weir box during HOT SHUTDOWN, access to this area can only safely be accomplished with the plant in COLD SHUTDOWN.

Although the primary system for monitoring drywell floor drain sump flow is now inoperable and is irreparable during plant operation, alternative methods are available and currently in use for determining the drywell floor drain sump flow rate (as further described in Attachment 2). On this basis, continued plant operation is justified. However, in light of the current Technical Specification requirement for a plant shutdown, IP is submitting this application for amendment to revise the Technical Specifications on a one-time basis and requests that this application be reviewed prior to July 10, 1994.

Sincerely yours,

J. G. Cook
Vice Presi 'ent

TAB/csm

Attachments

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

Attachment 1
to U-602303

J. G. Cook, being first duly sworn, deposes and says: That he is Vice President of Illinois Power Company; that the application for amendment of Facility Operating License NPF-62 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.

DATED: This 20th day of June 1994.

Signed: J. G. Cook

STATE OF ILLINOIS } SS.
DeWitt COUNTY }

Subscribed and sworn to before me this 20th day of June 1994.

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

Jacqueline S. Matthias
(Notary Public)

Reason for Request

In early February 1994, control room personnel began noticing perturbations of the indicated drywell floor drain sump inlet flow (UNIDENTIFIED LEAKAGE rate). After verifying that actual leakage increases had not occurred (using alternative methods available to detect or measure leakage), the drywell floor drain sump inlet flow instrumentation was declared inoperable. OPERABILITY of the drywell floor drain sump inlet flow rate instrumentation is required by Clinton Power Station (CPS) Technical Specification (TS) 3/4.4.3.1, "Reactor Coolant System Leakage-Leakage Detection Systems." The TS limits continued plant operation to 30 days with the drywell floor drain sump flow rate instrumentation inoperable, provided the drywell floor drain sump flow rate is determined by alternate means at least once per eight hours. Otherwise, the plant is required to be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

Every effort was made to troubleshoot the problem with the instrumentation while the plant was operating. However, initial efforts to restore the drywell sump inlet flow monitoring instrumentation to OPERABLE status were unsuccessful. These efforts included actions to verify free flow through the weir box to eliminate any potential obstructions in the V-notch as the cause for the erratic instrumentation readings. In addition, a decade capacitor was connected to the transmitter for a period of time to determine the stability of the instrumentation loop outside the drywell. The subsequent analysis indicated that the problem was located between the weir box and the transmitter (first accessible component outside the drywell) and that the instrument loop from the transmitter up to the main control room was operating properly. Since the drywell is inaccessible during plant operation and since high temperature conditions continue to exist in the area of the weir box even during HOT SHUTDOWN conditions, further troubleshooting and repair of the drywell floor drain sump inlet flow rate monitoring instrumentation required that the plant be in COLD SHUTDOWN. On the basis that alternate methods were available to determine the drywell floor drain sump flow rate and in order to preclude an unnecessary plant transient and the related plant risk associated with a plant shutdown, Illinois Power (IP) requested that continued operation of CPS be allowed until the next time the plant was brought to COLD SHUTDOWN, at which time repairs could be made. The NRC found the IP proposal to be acceptable and issued License Amendment No. 89 which required the drywell floor drain sump flow monitoring system to be considered inoperable, but allowed a one-time extension of the 30-day allowed out-of-service time until the first plant shutdown (COLD SHUTDOWN) after March 15, 1994.

On April 16, 1994, IP removed CPS from service for Planned Outage 6 (PO-6) for Reactor Recirculation pump seal replacement. During this outage, the weir box was inspected and was found to be relatively clean and dry. A coating of unidentified material was found on the probe and was subsequently washed off during calibration of the

instrumentation. The instrumentation zero and span were found to be out of calibration, and it was therefore thought that the problem was an instrumentation failure. In addition, the probe connection box and cable were inspected for moisture intrusion. None was identified. The cable between the transmitter and probe was meggered with no indication of moisture or insulation breakdown being evident. The resistance between the weir wall and the weir box lid was measured and was found to be higher than expected due to the corrosion between the weir box lid and walls. In an effort to improve the capacitive geometry of the probe with that of the weir, a positive mechanical ground between the lid and the wall was provided. The probe was also replaced and the system was recalibrated.

Following the outage, the drywell sump inlet flow monitoring instrumentation appeared to be consistent with plant conditions and matched the calculated leakage using the sump pump run timers. As a result, it was determined that the problem had been corrected. However, in May (1994), control room personnel began to again see inconsistent indications from the drywell floor drain sump inlet flow rate instrumentation. While the instrumentation did not behave erratically as observed prior to PO-6, the flow rate recorder was showing a continually increasing flow rate. Based on this observation and the divergence of the recorded flowrate from the calculated flowrate of the drywell floor drain sump pump run times, the instrumentation was declared inoperable on June 10, 1994. IP has developed an action plan to identify and correct the problems with this instrumentation. As part of this action plan, IP intends to do everything possible to restore the instrumentation to OPERABLE status with the plant in operation. However, based on previous experience with troubleshooting problems in this instrumentation, it is expected that efforts to restore the drywell sump inlet flow monitoring instrumentation to OPERABLE status will require entry into the drywell. In addition, as before, high temperatures in the area of the weir box preclude safe entry into the drywell until the plant is in COLD SHUTDOWN. Therefore, IP requests that continued operation of CPS be allowed until the next time the plant is brought to COLD SHUTDOWN, when repairs can safely be made.

Background

The drywell sump flow monitoring system at CPS consists of two subsystems. Each subsystem contains a monitoring system for each of two sumps, the floor drain sump and the equipment drain sump. Each subsystem consists of a V-notched weir box with a capacitance-type probe that senses the V-notch water level. (The weir box is situated between the drains and the sump. See Figures 1, 2, and 3.) The V-notch water level is proportional to the flow through the weir box, which in turn is equal to the sump inlet flow rate. Each subsystem includes a recorder with indication and an alarm which will actuate when the flow rate exceeds a certain value. Also included is a digital flow totalizer which provides an integrated flow that can be utilized to determine average sump flow rates. This system of components is the system normally used to monitor sump flow

and is the system required to be OPERABLE by Technical Specification 3/4.4.3.1 for monitoring the drywell floor drain and drywell equipment drain sump flows. It should also be noted that, with respect to the monitoring of UNIDENTIFIED LEAKAGE, this is the only system at CPS that meets the accuracy requirements of Regulatory Guide 1.45 for drywell floor drain sump flow monitoring.

The CPS design also includes a system of pumps and pump-out timers, cycle counters and level switches for pumping collected leakage out of the sump(s). (A subsystem is provided for each sump.) This system can be monitored to provide an average flow rate (based on the pump run times and the pump design flow rate or based on the sump fill-up times, etc.) and can thus provide a backup means for determining the average drywell equipment and/or floor drain sump flow (i.e., IDENTIFIED and/or UNIDENTIFIED LEAKAGE) over a certain time interval.

Alarms associated with the drain sumps are provided in the main control room. The setpoints for these alarms are based on the length of time the sump pumps operate. As described in USAR Section 7.7.1.24.10.1.1, if the sump pumping cycles become too lengthy or too frequent, it is indicative of a higher-than-normal influent flow rate to the sump due to high leakage rates. Pumping cycles that are too lengthy or too frequent are thus alarmed in the main control room using two timers which are operated by the sump pump controls. One will alarm if the pump-out time is too long, the other if the sump fill-up time is too short.

As described in USAR Sections 7.7.1.24.10.1 and 5.2.5, UNIDENTIFIED LEAKAGE into the drywell is also monitored by a flow rate meter in the condensate discharge line from the drywell air coolers (with an associated alarm in the main control room set at two gpm) and by a particulate and a gaseous radiation monitoring channel of the drywell fission product monitor. While the drywell fission product monitor does not provide a quantitative leakage rate, it is sensitive enough to provide plant operators with an early indication of an unanticipated increase in the UNIDENTIFIED LEAKAGE rate involving reactor coolant.

Furthermore, as described in USAR Section 5.2.5, two other parameters are monitored with appropriate instrumentation to provide the plant operators with indirect indication of increases in UNIDENTIFIED LEAKAGE. These parameters include drywell pressure and drywell temperature.

Description of Proposed Change

In support of the above request, IP is requesting that a footnote be added to the Action Statement that must be entered when the required drywell floor drain sump inlet flow monitoring instrumentation is inoperable, as provided in Attachment 3. Specifically, IP proposes that the following footnote be attached to TS 3/4.4.3.1 Action b.2:

"Operation may continue after July 10, 1994, until the next COLD SHUTDOWN, provided the drywell floor drain sump flow rate is monitored and determined by alternate means at least once per 8 hours. Additionally, the drywell atmosphere particulate and gaseous radioactivity monitoring systems may be periodically taken out-of-service to perform scheduled preventive maintenance, surveillances and testing without entering the shutdown requirements of the ACTION statement."

In addition, IP previously requested implementation of the Improved Standard Technical Specifications (IP letter U-602196). Attachment 4 contains marked-up copies from that request reflecting this proposed change.

Justification for Proposed Change

The design basis accident involving leakage into the drywell is a guillotine break of the recirculation system suction piping. As described in USAR Section 6.2, this accident is mitigated by safety systems that are automatically initiated in response to high drywell pressure and/or low reactor water level. This proposed change does not affect any of these safety systems or the associated instrumentation that provides automatic initiation of these systems.

For smaller leaks into the drywell from unidentified sources, multiple systems are available to plant operators to indicate changes in UNIDENTIFIED LEAKAGE rates. The system normally used (the drywell floor drain sump V-notched weir box system) meets the accuracy and sensitivity requirements of Regulatory Guide 1.45. (However, as stated in USAR Section 7.7.1.24.1, no credit is taken in the safety analysis for operation of or operator reliance upon the leakage detection monitoring instrumentation associated with the drywell sump.) The UNIDENTIFIED LEAKAGE rate can also be calculated at least once per eight hours as required by the CPS Technical Specifications using the sump pump run timers. Further, any significant increases in leakage will be promptly identified to the plant operators by the drywell gaseous and/or particulate channels of the drywell atmospheric radiation monitoring system.

On the basis that the affected instrumentation is not credited in the safety analysis and that there are alternate methods available to quantitatively determine the UNIDENTIFIED LEAKAGE rate into the drywell, it is overly restrictive to require the plant to be taken through an unnecessary transient and be subject to the associated risks caused by shutting down just to repair this instrumentation. Thus, IP is requesting that operation be allowed to continue until the next plant shutdown to COLD SHUTDOWN which would be the first opportunity to safely repair the affected instrumentation.

The need for the plant to be in COLD SHUTDOWN to perform repairs is based on personnel safety. The weir box is located beneath the reactor vessel. While radiation levels in this area during HOT SHUTDOWN are a concern, the high temperature levels combined with the fact that the area is designated a contamination area present an even greater problem with respect to being able to work on the weir box. Personnel entering this area would be required to wear respirators and double anti-contamination suits. Since normal drywell ventilation systems are not particularly effective in this location, temperatures in this region during HOT SHUTDOWN conditions could approach 140°F. Personnel entering under these conditions would be required to wear ice packs, would need to be monitored for heat stress, and would be limited to approximately 20-minute stay times. Cooling the plant to COLD SHUTDOWN would result in primary coolant system temperatures of less than 200°F and would result in conditions which would be more tolerable for personnel entry. Therefore, viewed from a personnel safety aspect, it would be more appropriate for COLD SHUTDOWN to be the entry condition to effect repairs as opposed to HOT SHUTDOWN.

The proposed change will require the drywell floor drain sump flow monitoring system to be considered inoperable (in its current state), but will allow a one-time extension of the 30-day allowed out-of-service time until the next plant shutdown to COLD SHUTDOWN conditions. In addition, the proposed footnote includes an allowance that permits the drywell atmosphere particulate and gaseous radioactivity monitoring system to be periodically removed from service to perform scheduled preventive maintenance, surveillances, and testing without entering the shutdown requirements of the Action Statement. This allowance is required since these monitors must be periodically removed from service to change the filter paper and perform other required surveillances. With both the floor drain sump inlet flow monitoring system and the drywell atmosphere particulate radioactivity monitoring system inoperable (due to being removed from service for the above-noted reasons), the Technical Specifications would require entry into the "otherwise" portion of the Action Statement which requires an immediate plant shutdown (i.e., HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the following 24 hours). Therefore, the proposed footnote will require the floor drain sump inlet flow monitoring system to be tracked as inoperable and the drywell floor drain sump flow rate to continue to be monitored by an alternate means at least once per eight hours in accordance with TS 3.4.3.1.

While the drywell floor drain sump V-notch weir box instrumentation is inoperable, the drywell floor drain sump flow rate will be monitored and determined utilizing the sump pump pump-out timers, cycle counters and level switches. Flow rates into the sump can be calculated based on the indicated run time for the pumps and the known pump flow rates or by monitoring the sump fill-up times (the time periods from when the sump pumps are switched off until the next time the pumps are switched on) and considering the volume corresponding to the current level control band. Sump level is normally maintained within an approximate six-inch band with the pump control circuit operating in

its normal mode of operation. However, with the sump pump control switch in the "after-start" position, sump level is maintained in a one to two-inch level band at a low level in the sump. In this mode of operation, one sump pump is currently operating for approximately 3 minutes every 6 1/2 hours. Using either of the two above-described methods for calculating leakage, the current sump flow rate is approximately 0.4 gpm. Plant personnel are currently trending both the pump run times and the sump fill-up times. Since increased leakage rates would result in more frequent pump operation, this trending provides the sensitivity needed to determine significant changes in leakage.

Limits on leakage into the drywell are provided in TS 3/4.4.3.2, "Reactor Coolant System Leakage - Operational Leakage." That Technical Specification limits IDENTIFIED LEAKAGE to 25 gpm (averaged over any 24-hour period), UNIDENTIFIED LEAKAGE to 5 gpm, and UNIDENTIFIED LEAKAGE increases to 2 gpm in any 24-hour period or less. In order to ensure that these limits are not exceeded, the IDENTIFIED and UNIDENTIFIED LEAKAGE rates must be determined on a periodic basis. The UNIDENTIFIED LEAKAGE rate is determined, in part, by determining the flow rate into the drywell floor drain sump. The alternate methods described above are sufficient to determine whether UNIDENTIFIED LEAKAGE in the drywell exceeds the 5 gpm limit and whether changes in this leakage exceed the limit of a 2 gpm increase in any 24-hour period or less, as specified in TS 3/4.4.3.2. These methods will provide the operators with the necessary information to take appropriate action in response to an increase in leakage.

Basis for No Significant Hazards Consideration

In accordance with 10CFR50.92, a proposed change to the operating license (Technical Specifications) involves no significant hazards consideration if operation of the facility in accordance with the proposed change would not: (1) involve a significant increase in the probability or consequences of any accident previously evaluated, (2) create the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in a margin of safety. The proposed changes are evaluated against each of these criteria below.

(1) The proposed change does not affect any initiators of any previously evaluated accidents. Additionally, the proposed change involves equipment that only provides indication, and therefore cannot increase the probability of any accident previously evaluated.

As stated in USAR Section 7.7.1.24.1, no credit is taken in the safety analysis for operation of or operator reliance upon the leakage detection monitoring instrumentation associated with the drywell sumps. Notwithstanding, the drywell

floor drain sump flow monitoring system provides the capability to detect and measure leakage from unknown sources of leakage in the drywell. The drywell floor drain sump inlet flow monitoring V-notched weir box instrumentation is designed to meet the accuracy requirements of Regulatory Guide 1.45. This instrumentation does not provide any automatic action or control functions. In addition to the V-notch system, drywell floor drain sump flow rates can be determined by using the sump pump pump-out timers, cycle counters and level switches. In addition, UNIDENTIFIED LEAKAGE into the drywell is monitored by a flow rate meter in the condensate discharge line from the drywell air coolers and by a particulate and gaseous radiation monitoring channel of the drywell fission product monitor. While the drywell fission product monitor does not provide a quantitative leakage rate, it is sensitive enough to provide plant operators with early indication of an unanticipated increase in UNIDENTIFIED LEAKAGE. Furthermore, two other parameters are monitored with appropriate instrumentation to provide the plant operators with indirect indication of increases in UNIDENTIFIED LEAKAGE. These parameters include drywell pressure and drywell temperature. These alternate methods of detecting increases in UNIDENTIFIED LEAKAGE rates provide operators with sufficient information to take appropriate action to respond to an increase in leakage. Based on the above, IP concludes that the proposed change will not increase the consequences of any accident previously evaluated.

(2) The proposed change does not involve any modification to plant structures or components and only involves equipment that provides indication of leakage to the plant operators. The affected equipment does not provide any automatic action or control functions. As a result, the proposed change does not involve a change in the operation of the plant, nor does it introduce any new failure modes. Therefore, this proposed change cannot create the possibility of a new or different kind of accident from any accident previously evaluated.

(3) The margin of safety associated with the instrumentation affected by the proposed change may be related to the limits on UNIDENTIFIED LEAKAGE. As stated in the Bases for Technical Specification 3/4.4.3.2, "The allowable leakage rates from the reactor coolant system have been based on the predicted and experimentally observed behavior of cracks in pipes...The evidence obtained from experiments suggests that for leakage somewhat greater than that specified for UNIDENTIFIED LEAKAGE the probability is small that the imperfection or crack associated with such leakage would grow rapidly. With respect to Intergranular Stress Corrosion Cracking (IGSCC)-related cracks in service sensitive austenitic stainless steel piping however, an additional limit on the allowed increase in UNIDENTIFIED LEAKAGE within a 24-hour period or less) is imposed in accordance with NRC Generic Letter 88-01, 'NRC Position on

IGSCC in BWR Austenitic Stainless Steel Piping,' since an abrupt increase in the UNIDENTIFIED LEAKAGE could be indicative of leakage from such a source." The proposed change does not alter any of these limits on the UNIDENTIFIED LEAKAGE.

As previously described, flow rates into the drywell floor drain sump can be determined based on the indicated run time for the sump pumps and the known pump flow rates or by monitoring the sump fill-up times and considering the volume corresponding to the current level control band. These alternate methods are sufficient to determine whether UNIDENTIFIED LEAKAGE in the drywell exceeds the 5 gpm limit and whether changes in this leakage exceed the limit of a 2 gpm increase in any 24-hour period or less.

Additionally, with respect to the ability to detect changes in UNIDENTIFIED LEAKAGE rates, in addition to the V-notch system, drywell floor drain sump flow rates can be determined by using the sump pump pump-out timers, cycle counters and level switches. In addition, UNIDENTIFIED LEAKAGE into the drywell is monitored by a flow rate meter in the condensate discharge line from the drywell air coolers and by a particulate and gaseous radiation monitoring channel of the drywell fission product monitor. While the drywell fission product monitor does not provide a quantitative leakage rate, it is sensitive enough to provide plant operators with early indication of an unanticipated increase in the UNIDENTIFIED LEAKAGE rate involving reactor coolant. Furthermore, two other parameters are monitored with appropriate instrumentation to provide the plant operators with indirect indication of increases in UNIDENTIFIED LEAKAGE. These parameters include drywell pressure and drywell temperature.

As stated above, the drywell floor drain sump flow monitoring instrumentation does not provide any automatic action or control functions. Further, as stated in USAR Section 7.7.1.24.1, no credit is taken in the safety analysis for operation of or operator reliance upon the leakage detection monitoring instrumentation associated with the drywell sumps.

In light of all the above, IP concludes that the proposed change does not involve a reduction in the margin of safety.

Based on the foregoing, IP concludes that the proposed change does not involve a significant hazards consideration.

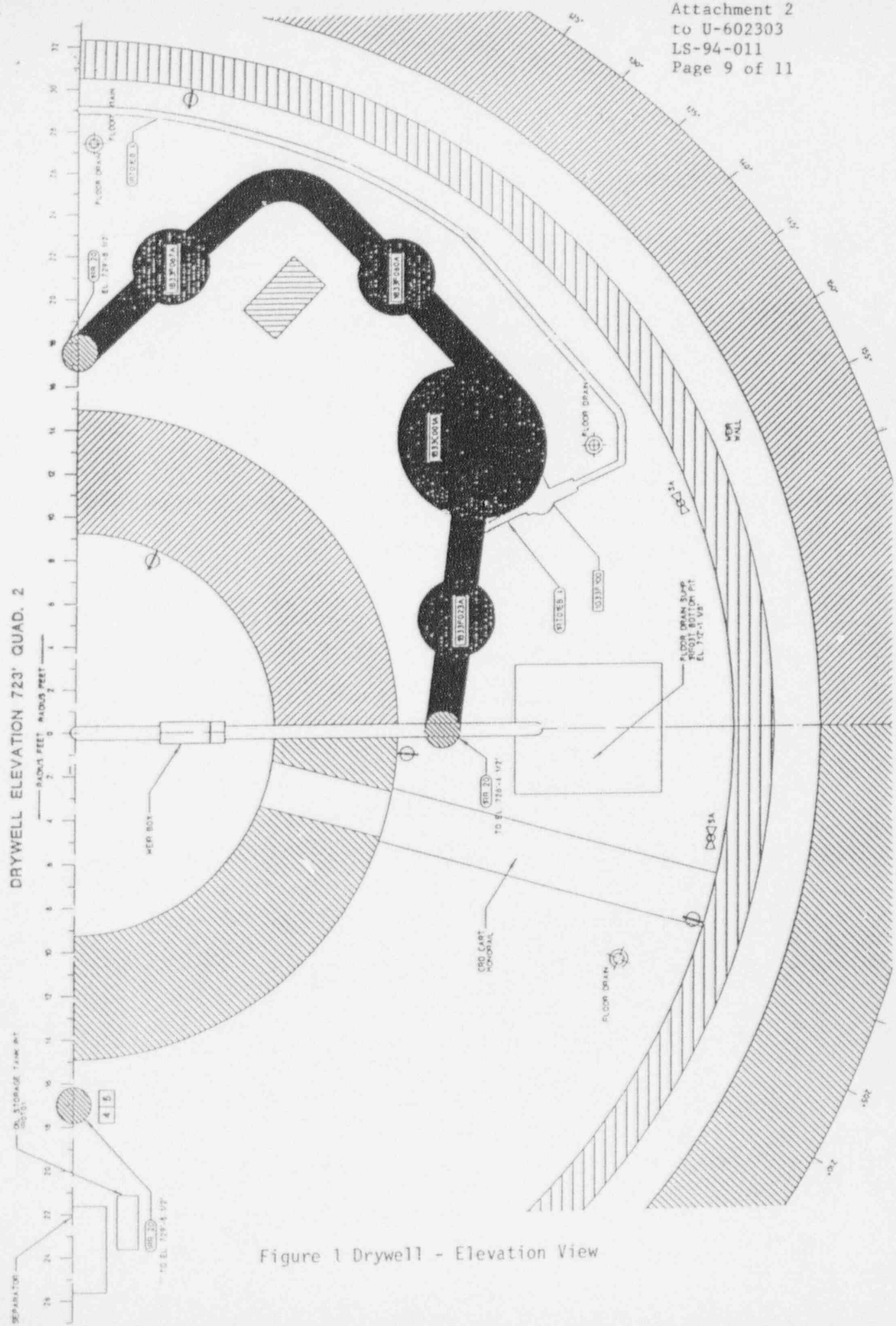

Figure 1 Drywell - Elevation View

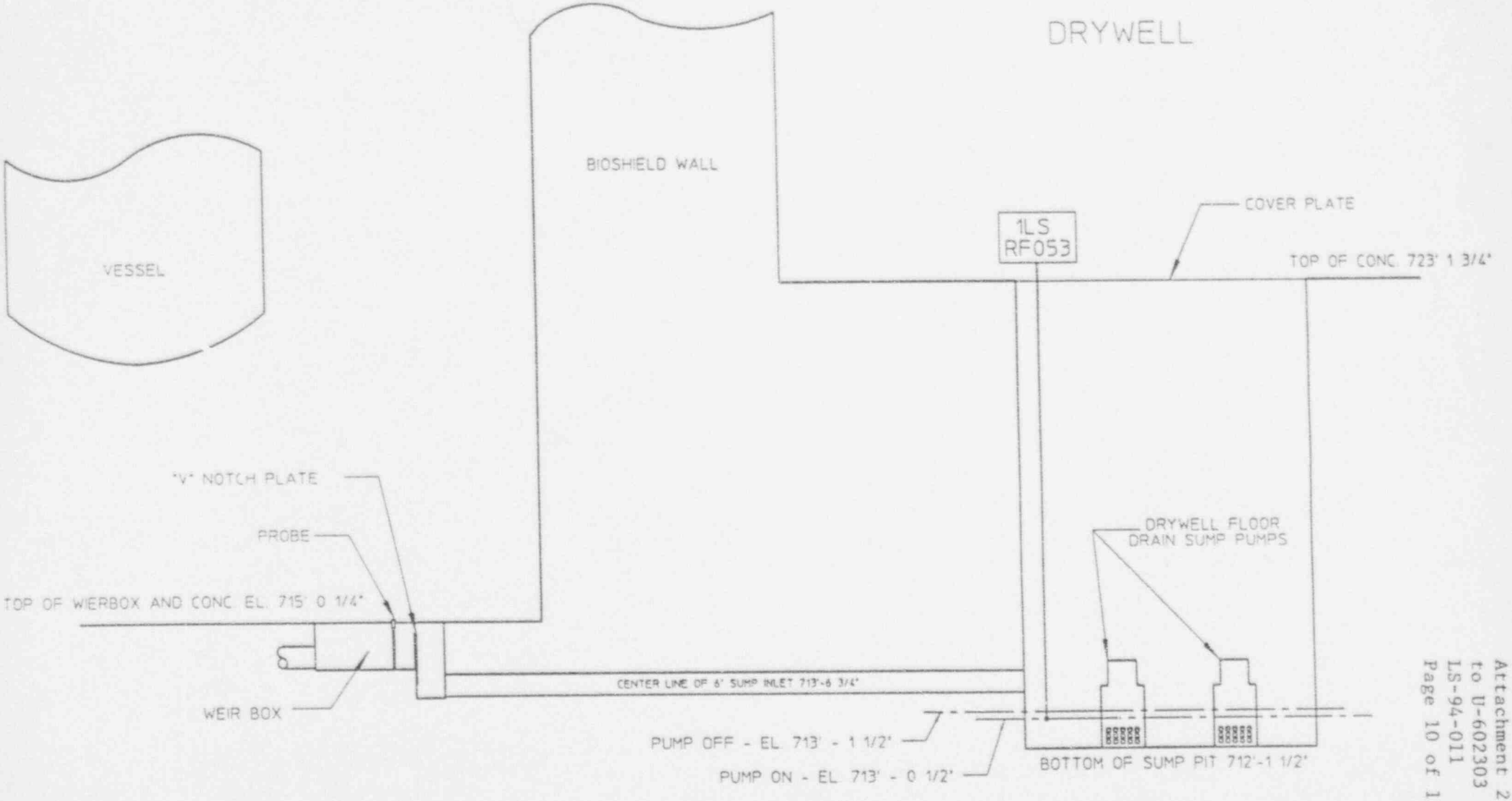

Figure 2
Drywell Floor Drain Sump - Plan View

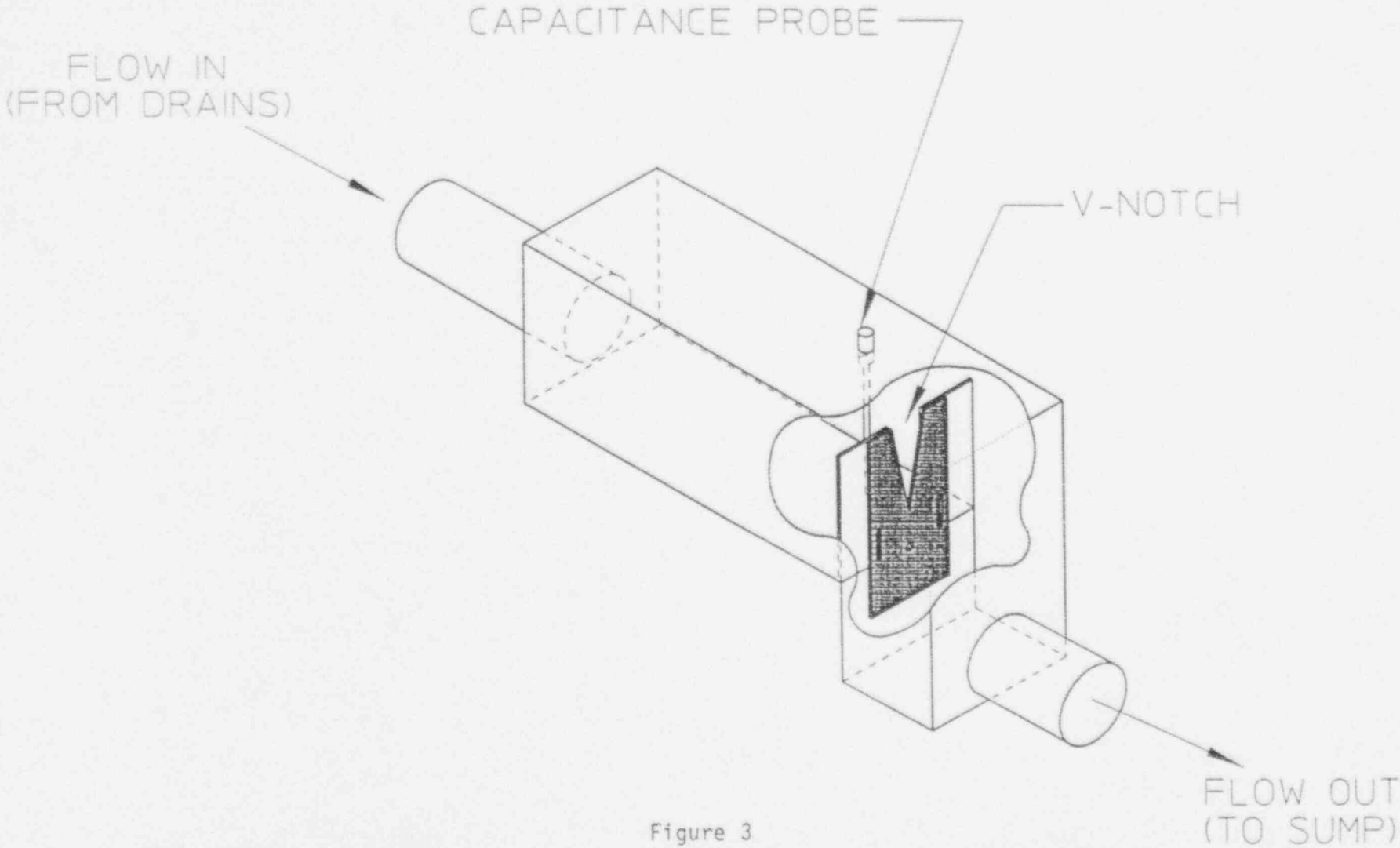

Figure 3

V-NOTCHED WEIR BOX