WOLF CREEK
NUCLEAR OPERATING CORPORATION

Cleveland Reasoner
Vice President Engineering

June 26, 2014

ET 14-0018

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

Subject: Docket 50-482: 10 CFR 50.55a Request I3R-10 for the Third Inservice Inspection Program Interval

Gentlemen:

Pursuant to 10 CFR 50.55a(a)(3)(ii), Wolf Creek Nuclear Operating Corporation (WCNOC) hereby requests Nuclear Regulatory Commission (NRC) approval of 10 CFR 50.55a Request Number I3R-10 for the Third Ten-Year Interval of WCNOC's Inservice Inspection (ISI) Program. The Attachment provides 10 CFR 50.55a Request I3R-10, which requests relief from the Pressure Test Requirements of ASME Section XI IWB-5220.

Performance of the proposed alternative pressure testing of this Request will be performed in Refueling Outage 20, which begins February 28, 2015. Therefore, approval is requested by March 6, 2015.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4171, or Mr. Michael J. Westman at (620) 364-4009.

Sincerely,

Cleveland Reasoner

COR/rlt

Attachment

A047
NRR

cc: M. L. Dapas (NRC), w/a
C. F. Lyon (NRC), w/a
N. F. O'Keefe (NRC), w/a
Senior Resident Inspector (NRC), w/a

Wolf Creek Nuclear Operating Corporation

10 CFR 50.55a Request I3R-10

Request for Relief from the Pressure Test Requirements of ASME Section XI IWB-5220

10 CFR 50.55a Request I3R-10

Request for Relief from the Pressure Test Requirements of ASME Section XI IWB-5220

Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(ii) Hardship or Unusual Difficulty Without Compensating Increase in Level of Quality or Safety

1.0 ASME Code Components Affected

The affected components are the Wolf Creek Generating Station (WCGS) ASME Code Class 1 piping and components connected to the Reactor Coolant System (RCS) that are isolated from direct RCS pressure (2235 psig) during normal operation by their location, either upstream of a check valve, between two check valves or between two closed valves that must remain closed during the unit's operation in Modes 1, 2 or 3. The specific portions of piping for which relief is requested are described below.

Notes:

a) RCS double isolation valves in this Request are described as inboard (1st off) or outboard (2nd off) valves relative to their location from the RCS loop.
b) Informational marked drawings/diagrams that show the configurations of piping relative to the RCS are included in Attachment 2 to this Request.
c) Piping segment lengths are given in approximate total run of piping components (excluding valve bodies) as installed for each individual pipe size.

Portion 1: Auxiliary Pressurizer Spray

Auxiliary Pressurizer Spray, 2 inch, Class 1 piping and components upstream of inboard Pressure Isolation Valve (PIV) check valve BBV0084 out to and including the outboard isolation valve, BGHV8145 (globe valve).

Portion 1 piping is shown on Attachment 2 drawings M-12BB02 and M-12BG01, while the piping materials and segment lengths, listed by nominal pipe size (NPS) are listed in Attachment 1.

Portion 2: RCS to Residual Heat Removal (RHR) Pump Suction

RCS to RHR Pump Suction, 12 inch, Class 1 piping and components between isolation gate valves BBPV8702B and EJHV8701B and between isolation gate valves BBPV8702A and EJHV8701A.

Portion 2 piping is shown on Attachment 2 drawings M-12BB01 and M-12EJ01 while the piping materials and segment lengths, listed by NPS are listed in Attachment 1.

Portion 3: Emergency Core Cooling System (ECCS) High Head Safety Injection

ECCS High Head Cold Leg Safety Injection, 3 inch and 1-1/2 inch, Class 1 piping and components between and including the following series double isolation check valve pairs:

- Loop 1 - EMV8815 and BBV0001
- Loop 2 - EMV8815 and BBV0022
- Loop 3 - EMV8815 and BBV0040
- Loop 4 - EMV8815 and BBV0059

Portion 3 piping is shown on Attachment 2 drawings M-12BB01 and M-12EM02 while the piping materials and segment lengths, listed by NPS are listed in Attachment 1.

Portion 4: ECCS Intermediate and Low Head Safety Injection
ECCS Intermediate Head, Accumulator, and Low Head Cold Leg Safety Injection, 10 inch, 6 inch, 2 inch, and 1 inch, Class 1 piping and components within the boundaries listed below:

Outboard Check Valves (in parallel)

	Intermediate Head	Accumulator Discharge	Low Head (RHR)
Loop 1	EPV0010	EPV8956A	EPV8818A
Loop 2	EPV0020	EPV8956B	EPV8818B
Loop 3	EPV0030	EPV8956C	EPV8818C
Loop 4	EPV0040	EPV8956D	EPV8818D

to inlet side of Cold Leg Safety Injection inboard PIV check valves BBV8948A, BBV8948B, BBV8948C, and BBV8948D.

Portion 4 piping is shown on Attachment 2 drawings M-12BB01 and M-12EP01 while the piping materials and segment lengths, listed by NPS are listed in Attachment 1.

Portion 5: Hot Leg Safety Injection
Hot Leg Safety Injection, 8 inch, 6 inch, and 2 inch, Class 1 piping and components within the following boundaries:

	Outboard ECCS Hot Leg Recirc	Outboard RHR Hot Leg Recirc	Inboard Hot Leg Recirc
Loop 1	EMV0003		BBV8949A
Loop 2	EMV0001	EJV8841A	BBV8949B
Loop 3	EMV0002	EJV8841B	BBV8949C
Loop 4	EMV0004		BBV8949D

Portion 5 piping is shown on Attachment 2 drawings M-12BB01 and M-12EM01 while the piping materials and segment lengths, listed by NPS are listed in Attachment 1.

Portion 6: RCS Vents (1 inch) and Drains (2 inch)
Reactor Head Vent, 1 inch, Class 1 piping and components associated with the Reactor Head Vent Path between and including the following series isolation vent valve pairs:

- BBV0233 and BBV0481 (manually operated Reactor Head Vent valves)
- BBV0484 and BBV0485 (manually operated Reactor Head Vent valves)

The 1 inch vent piping configuration is shown on Attachment 2 drawings M-12BB04 while the piping materials and segment lengths, listed by NPS are listed in Attachment 1.

RCS Loop Drain, 2 inch, Class 1 piping and components within the RCS Loop Drain series isolation boundary valves to the liquid recycle system described below:

- Loop 1 - BBV0008 and BBV0009
- Loop 2 - BBV0028 and BBV0029
- Loop 3 - BBV0047 and BBV0048
- Loop 4 - BBV0066 and BBV0067

The 2 inch drain piping configuration is shown on Attachment 2 drawings M-12BB01 while the piping materials and segment lengths, listed by NPS are listed in Attachment 1.

2.0 Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel (BPV) Code Section XI, 1998 Edition through 2000 Addenda

3.0 Applicable Code Requirement

IWB-5221(a) states "The system leakage test shall be conducted at a test pressure not less than the pressure corresponding to 100% rated reactor power."

IWB-5222(b) states "The pressure retaining boundary during the system leakage test conducted at or near the end of each inspection interval shall extend to all class 1 pressure retaining components within the system boundary."

Application of the above ASME Code requirements to all Class 1 piping and components would require performance of a system leakage test at or near the end of each 10 year Inservice Inspection (ISI) Interval that would extend a test pressure equal to the nominal operating pressure (NOP) associated with 100% rated reactor power (nominally 2235 psig) to all Class 1 pressure retaining piping and components connected to the Reactor Coolant System. This would include the portions of Class 1 piping and components that are normally isolated from receiving (or cannot be verified to receive) 2235 psig due to their location between two check valves, between a downstream check valve and upstream closed valve, or between two closed valves that must remain closed during the unit's operation in Modes 1, 2 or 3.

4.0 Reason for Request

The following discussion provides the basis for the requested relief and NRC staff approval of the proposed alternative testing in accordance with 10 CFR 50.55a(a)(3)(ii) because complying with the above Code requirements would result in a hardship or unusual difficulty to the station without a compensating increase in the level of quality

and safety.

The hardship conditions are described below as they pertain to specific portions as described in Section 1.0.

Portions 1, 3, 4 and 5 have check valves as the inboard (downstream) RCS Class 1 isolation valve, which would require their pressure test be performed with the use of an alternate test pressure rig (hydro pump) to attain the required NOP pressure. Such conditions would pose a potential personnel safety hazard associated with operating such a temporary rig on a system at 2235 psig. Operation of the test equipment would require that personnel be stationed near open vent or drain valves, exposing them to unnecessary personal safety hazards in the event of a leak from the non-class test pressure rig connections. A break at any connection in the rig under such conditions (temporary non-code connections under RCS test pressure) would pose a substantial personnel safety hazard.

Additionally, pressurization of any such piping segment in this manner has the potential to unseat the inboard series Class 1 check valves, creating the potential for introduction of test medium fluid (non-borated water) with a resulting inadvertent RCS dilution. In addition to the unplanned RCS dilution, Technical Specification Limiting Condition of Operation (LCO) 3.4.14, "RCS Pressure isolation Valve (PIV) Leakage," imposes allowable leakage limits for RCS PIVs, and establishment of the required test pressure could result in the LCO not being met and entry into Condition A.if an inboard PIV were to become unseated.

For Portion 2, use of an alternative test rig to test those isolated portions of piping to full RCS operating pressure would have to include application of a compatible pressurized medium. This would result in personnel stationed near open vent or drain valves, exposing them to unnecessary personal safety hazards in the event of a leak from the non-class test pressure rig connections. A break at any connection of the rig under such conditions (temporary non-code connections under RCS test pressure) would pose a substantial personnel safety hazard.

For Portion 6, the inboard manual isolation valves would be opened to check for leakage between the inboard and outboard valves. This requires personnel to be in close proximity to high pressure and temperatures during this operation. The personal safety issue is lessened at lower pressures and temperatures.

The Class 1 piping identified in Portions 1-6 are subjected to borated water which would leave a boron residue and show up as a visual indication if leakage should occur in any of the identified piping segments. The VT-2 examinations that are performed each refueling outage on all Class 1 piping would identify the boron residue as a relevant condition and potential leak location that would require further examination and evaluation.

Additional reasons stemming from hardships (as they apply to specific Portions of piping) are given below.

Reasons for Request Specific to Portion 1:
Performing a pressure test on the Portion1 piping to the Code requirement (RCS NOP) requires initiating Auxiliary Pressurizer Spray flow at RCS NOP, as there are no test connections (vent or drain) between the upstream globe valve and the downstream check valve. Initiation of Auxiliary Spray would cause a thermal design transient ("Inadvertent Auxiliary Spray") due to the captive piping fluid volume being at ambient containment temperature (~110°F). This design transient has a limited number of allowed cycles (10 total for the life of the plant) per the Wolf Creek Updated Safety Analysis Report (USAR) Table 3.9(N)-13. The transient would also exceed the nominal maximum allowed differential temperature limit specified between spray water and pressurizer steam space of 320°F.

Reasons for Request Specific to Portion 2:
This piping is part of the RHR suction supply header from the RCS hot leg. Normal operational practice prohibits open alignment of the inboard Class 1 RHR suction isolation valves (BBPV8702A & BBPV8702B) at RCS pressure above 425 psig.

The inboard isolation valves BBPV8702A & BBPV8702B are equipped with a permissive open interlock which requires RCS pressure to be < 360 psig. The BBPV8702A & BBPV8702B interlock is a safety-related function to preclude the potential for an inter-system LOCA. Opening BBPV8702A or BBPV8702B at full RCS operating pressure to support testing of Portion 2 piping to the Code requirement would result in Technical Specification LCO 3.4.14 not being met for defeat of the open permissive interlock and entry into Condition C. BBPV8702A & BBPV8702B were not designed to assure closure against the resulting differential pressure associated with a line break or leak downstream of BBPV8702A/B.

Reasons for Request Specific to Portion 3:
These piping segments are associated with the High Pressure Coolant Safety Injection supply to the RCS cold-legs. Normal operational practice prohibits establishment of flow through isolation valves EMV8815, BBV001, BBV0022, BBV0040, and BBV0059 with full RCS pressure, except for emergency or transient conditions. Alignment of this flow-path with full RCS pressure conditions during Mode 3 would constitute a safety injection, and further result in a cold leg thermal design transient for the associated piping and valves (design limit is 60 for the life of the plant).

Technical Specification LCO 3.4.14 imposes allowable leakage limits for RCS PIVs, and establishment of the required test pressure could result in the LCO not being met and entry into Condition A if an inboard PIV were to become unseated.

Reasons for Request Specific to Portion 4:
These piping segments are associated with the Low and Intermediate Head Safety Injection supply to the RCS cold leg on each loop. During normal operation each piping segment is pressurized to the Cold Leg Accumulator pressure of 600 psig with a nominal differential pressure across the disc of approximately 1,650 psi. Establishing NOP test pressure between the two check valves for each series isolation requires use of temporary test rig with the resulting personnel and equipment hazards stated earlier.

As with Portion 3, Technical Specification LCO 3.4.14 imposes allowable leakage limits for RCS PIVs, and establishment of the required test pressure could result in the LCO not being met and entry into Condition A if an inboard PIV were to become unseated.

Reasons for Request Specific to Portion 5:
These piping segments are associated with the Low Head and Intermediate Head Safety Injection supply to the RCS hot legs. The piping cannot be pressurized to RCS NOP by alignment of the Intermediate Head Safety Injection Pumps through the normally closed hot leg isolation valves (EMHV8802A and EMHV8802B) nor the Low Head Safety Injection pumps and therefore would require use of a temporary test rig with the resulting personnel and equipment hazards stated earlier.

Normal operational practice prohibits flow through these flow-paths above Mode 4, except for emergency or transient conditions. Alignment of these flow-paths above Mode 4 would constitute a manual safety injection, and could further result in a thermal design transient for the hot leg safety injection nozzle. Alignment of the Intermediate Head Safety Injection Pump hot leg flow-path would further require entry into the Technical Specification 3.5.2, ECCS -Operating during Modes 1, 2, and 3.

As with Portions 3 and 4, Technical Specification LCO 3.4.14 imposes allowable leakage limits for RCS PIVs, and establishment of the required test pressure could result in the LCO not being met and entry into Condition A if an inboard PIV were to become unseated.

Reasons for Request Specific to Portion 6:
These piping segments are associated with the double isolation manual valve pairs for RCS pressure boundary. During normal operation all of the valves are maintained in a closed position, thus only the upstream side of the inboard isolation valve is assured to be exposed to full RCS pressure.

No connections exist between the valve pairs for test connection, therefore testing of the piping between the RCS drain/vent double isolation valves by hydro pump or temporary jumper is not possible.

Opening the inboard manual RCS isolation valve at full RCS operating pressure and elevated temperatures to support testing the subject piping segments per the Code

requirement would temporarily disable the "double valve barrier" between the RCS pressure boundary and non-code piping or containment atmosphere as required by 10 CFR 50.55a(c)(ii). Manually opening and closing these inboard valves at RCS pressure and temperature creates potential personnel safety issues.

5.0 Proposed Alternative and Basis for Use

Alternative Testing for All Portions:
Wolf Creek Nuclear Operating Corporation (WCNOC) proposes to use reduced pressure testing as an alternative for the Code required pressure testing (described in Section 3 above) on the listed portions of piping and components. The basis for the alternative testing is described below. All test pressures shall be equal to or greater than 300 psig. These pressures are sufficient to provide for the detection of any through wall leakage in the subject piping and components. The pressure tests and VT-2 examinations performed at the lower pressures (as an alternative to the pressure requirement in IWB-5221(a)) provide an acceptable level of assurance of the leakage integrity and operational readiness of the tested piping. Actual pressures used in testing of the various portions of piping will exceed 300 psig by as much as the test planning process, personnel safety, and/or the station and system conditions at the time of testing will allow.

Through-wall leakage that would occur at higher pressures such as RCS pressure would also reveal itself at lower pressures. It may take longer for some leaks to propagate through the piping wall at lower pressures but, while the resulting leak rates would be reduced, the leakage would still be visible to VT-2 examination.

Pressure boundary leakage can be modeled as a fixed area orifice whose leakage varies proportional to the square root of the ratio of the differential pressures (reference CRANE Technical Paper #410). Therefore, if a leak L were projected to be present at 2235 psig, that same leak would be present at 300 psig, but with a magnitude of

$\sqrt{(300/2235)} \times L = .37L$

Inspections that reveal no leakage at test pressures of 300 psig (where 37% of the leakage produced by 2235 psig pressures would be present for detection during VT-2 examination), therefore give reasonable assurance that no leakage would be present at 2235 psig.

Additionally, subsequent to the alternative testing described herein, all class 1 piping listed in this Request will be VT-2 examined with the RCS at full temperature and pressure and all components in their normal alignment, as part of the inspection boundary for the Class 1 Leakage Test performed at unit start-up in Mode 3.

The proposed alternative testing will be performed in the third period of the Third ISI Interval for WCGS during Refueling Outage 20, scheduled to begin February 28, 2015

6.0 Duration of Proposed Alternative

Relief is requested for the remainder of the Third Ten-Year ISI Interval, which ends on September 2, 2015. Implementation of the alternative testing will be performed during Refueling Outage 20, which is the last refueling outage of the Third Ten Year ISI Interval.

7.0 Precedents

NRC letter from W. H. Bateman, USNRC, to N. S. Carns, WCNOC, "Relief Request, 10-Year Hydrostatic Test - Wolf Creek Generating Station, (TAC No. M94599)," March 22, 1996.

NRC letter from G. Kulesa, USNRC, to R.T. Repko, Duke Energy, "McGuire Nuclear Station, Units 1 and 2 – Relief 09-MN-005 for Alternative Leakage Testing for Various American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Class 1 Piping and Components During the Third 10-Year Inservice Inspection (ISI) Interval (TAC Nos. ME1732 and ME1733)," June 14, 2010. ADAMS Accession No. ML101580422.

8.0 Attachments

A description of the piping materials installed for each portion of piping as well as the lengths of the piping segments for each NPS for which relief is requested is given in Attachment 1 to this Request.

The boundaries of the Portions of Class 1 piping and components covered in this Request are indicated on the informational, marked-up drawings/diagrams listed below and included as Attachment 2.

Portion 1	Auxiliary Spray	M-12BB02 M-12BG01
Portion 2	RCS to RHR Pump Suction	M-12BB01 B-12EJ01
Portion 3	ECCS High Head Safety Injection	M-12BB01 M-12EM02

Portion 4	ECCS Intermediate and Low Head Safety Injection	M-12BB01 M-12EP01
Portion 5	Hot Leg Safety Injection	M-12BB01 M-12EM01
Portion 6	RCS Vents and Drains	M-12BB01 M-12BB04

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ATTACHMENT 1

Piping Materials Size and Description

Portion 1 Piping					
Piping Components	NPS Diameter	Piping Material (Specification/Grade and Schedule Rating)	Design Pressure	~Overall Length of Piping (listed for each NPS)	
Pipe BG-027-BCA-2	2"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	7 inches	
Portion 2 Piping					
Pipe EJ-001-BCA-12	12"	Seamless Austenitic Steel SA-312/TP-304 Schedule 140	2485 psig	47 feet	
Pipe EJ-008-BCA-12	12"	Seamless Austenitic Steel SA-312/TP-304 Schedule 140	2485 psig	42 feet	
Portion 3 Piping					
EM-082-BCA-3	3"	Seamless Austenitic Steel SA-312/TP-304 Schedule 160	2485 psig	44 feet	
EM-083-BCA-1 1/2	1 ½"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	43 feet	
EM-084-BCA-1 1/2	1 ½"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	39 feet	
EM-086-BCA-1 1/2	1 ½"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	83 feet	
EM-087-BCA-1 1/2	1 ½"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	84 feet	
Portion 4 Piping					
EP-003-BCA-10	10"	Seamless Austenitic Steel SA-312/TP-304 Schedule 140	2485 psig	26 feet	
EP-026-BCA-6	6"	Seamless Austenitic Steel SA-312/TP-304 Schedule 160	2485 psig	23 feet	
EP-027-BCA-2	2"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	10 feet	
EP-006-BCA-10	10"	Seamless Austenitic Steel SA-312/TP-304 Schedule 140	2485 psig	28 feet	
EP-028-BCA-6	6"	Seamless Austenitic Steel SA-312/TP-304 Schedule 160	2485 psig	15 feet	
EP-029-BCA-2	2"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	7 feet	
EP-009-BCA-10	10"	Seamless Austenitic Steel SA-312/TP-304 Schedule 140	2485 psig	18 feet	
EP-030-BCA-6	6"	Seamless Austenitic Steel SA-312/TP-304 Schedule 160	2485 psig	9 feet	

EP-031-BCA-2	2"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	13 feet	
EP-012-BCA-10	10"	Seamless Austenitic Steel SA-312/TP-304 Schedule 140	2485 psig	8 feet	
EP-032-BCA-6	6"	Seamless Austenitic Steel SA-312/TP-304 Schedule 160	2485 psig	36 feet	
EP-033-BCA-2	2"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	19 feet	
Portion 5 Piping					
EM-017-BCA-2	2"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	34 feet	
EM-018-BCA-6	6"	Seamless Austenitic Steel SA-312/TP-304 Schedule 160	2485 psig	12 inches	
EM-009-BCA-2	2"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	18 feet	
EM-010-BCA-6	6"	Seamless Austenitic Steel SA-312/TP-304 Schedule 160	2485 psig	40 feet	
EM-012-BCA-2	2"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	26 feet	
EM-013-BCA-6	6"	Seamless Austenitic Steel SA-312/TP-304 Schedule 160	2485 psig	36 feet	
EM-020-BCA-2	2"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	48 feet	
EM-021-BCA-6	6"	Seamless Austenitic Steel SA-312/TP-304 Schedule 160	2485 psig	12 inches	
Portion 6 Piping					
BB-020-BCA-2	2"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	21 inches	
BB-037-BCA-2	2"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	15 inches	
BB-055-BCA-2	2"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	15 inches	
BB-074-BCA-2	2"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	12 inches	
BB-214-BCA-1	1"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	11 inches	
BB-305-BCA-1	1"	Seamless Austenitic Steel SA-376/TP-304 Schedule 160	2485 psig	10 inches	

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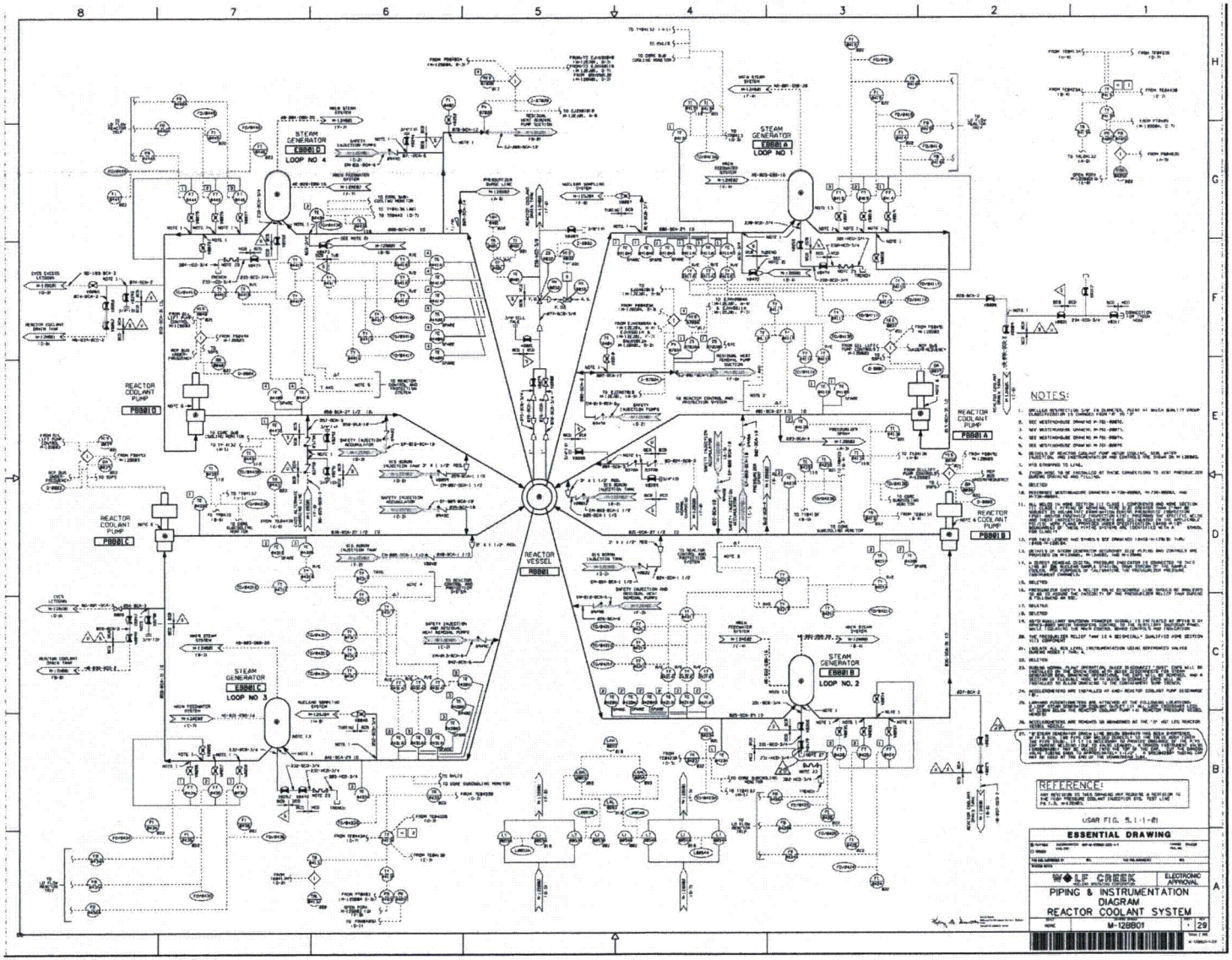
ATTACHMENT 2

Wolf Creek Nuclear Generating Station Flow Diagrams

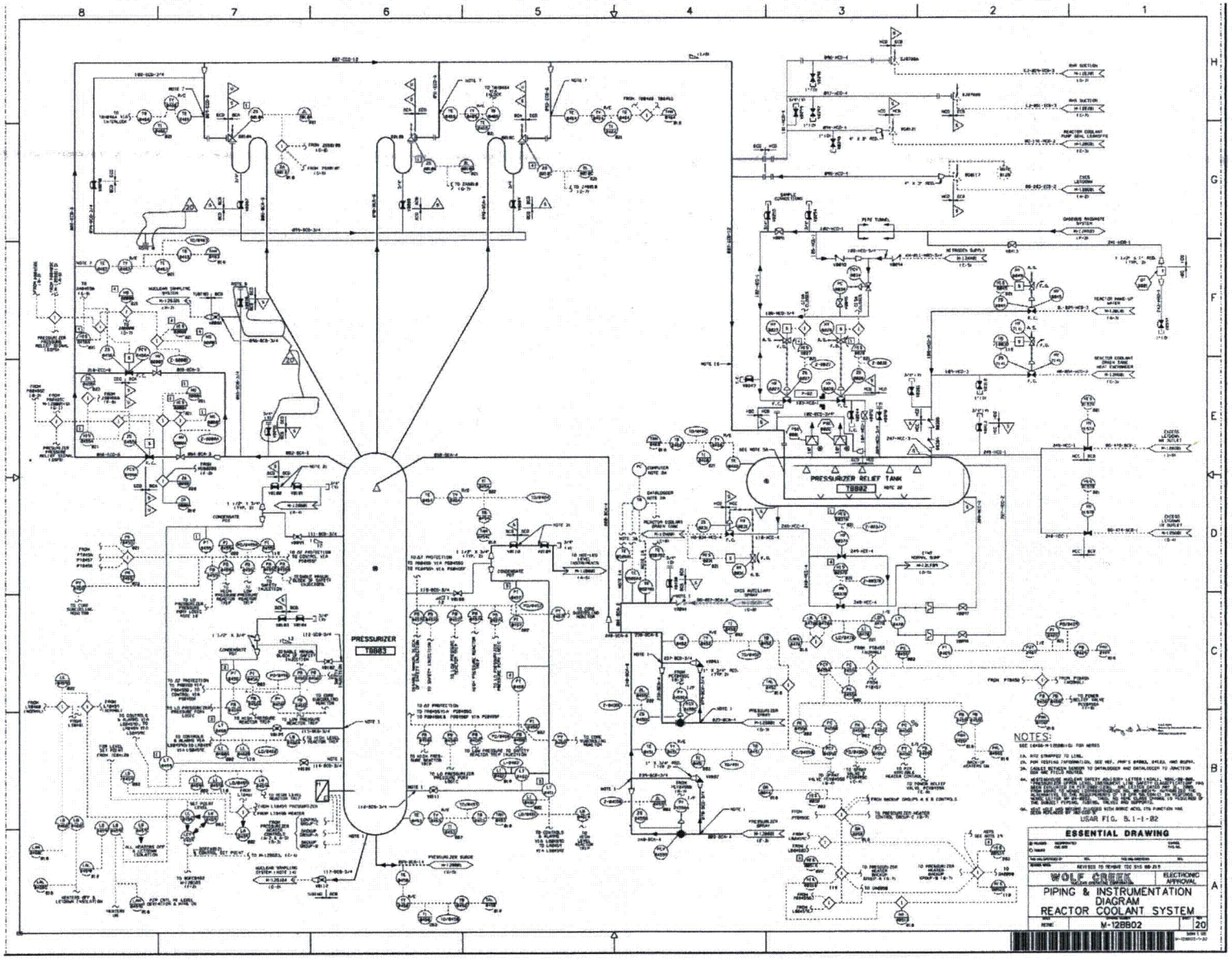
(8 Drawings Attached)

NOTE: These drawings are provided for Information Only

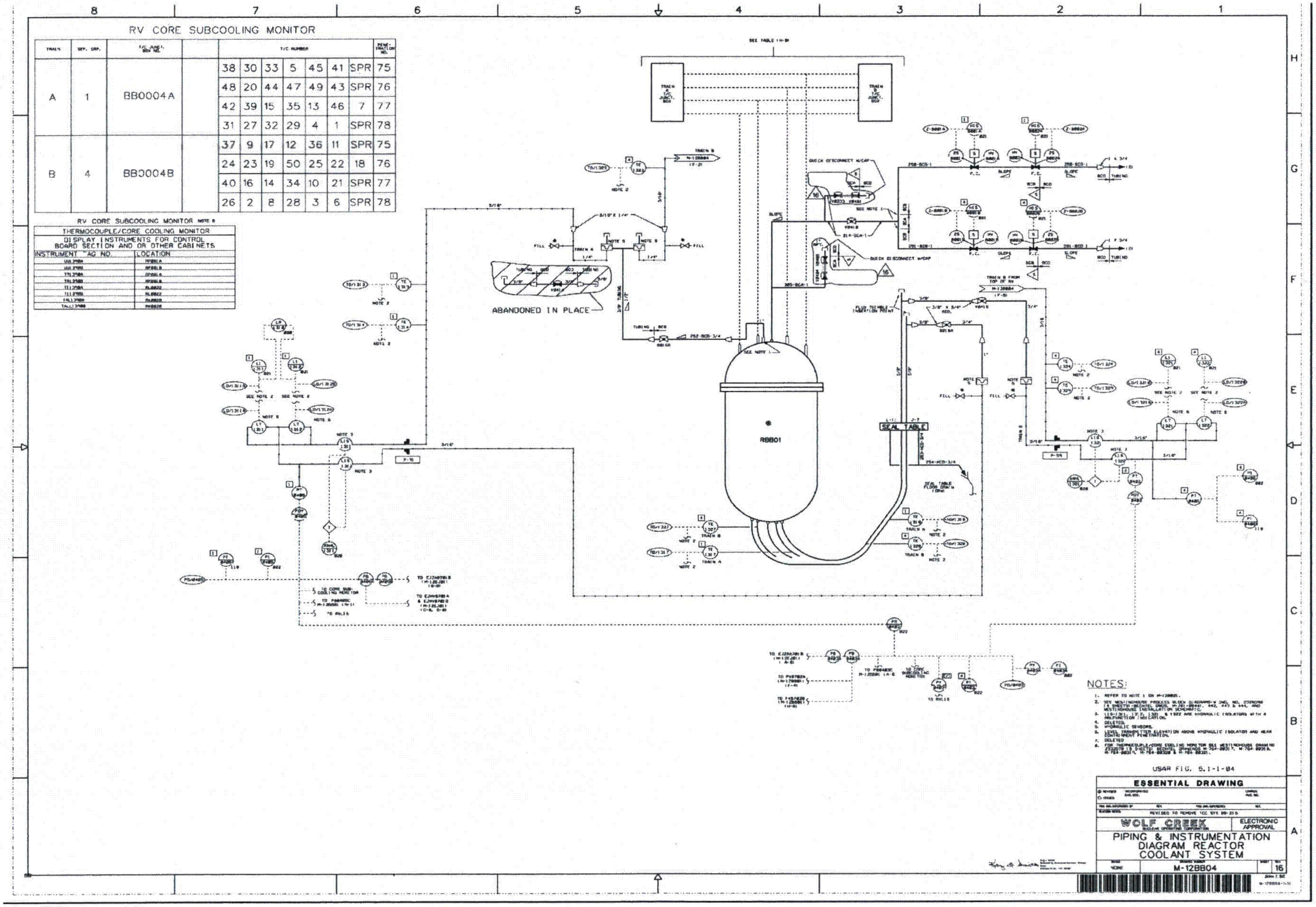
M-12BB01


STEAM GENERATOR
E88B1D
LOOP NO 4
STEAM GENERATOR
E88B1A
LOOP NO 1
STEAM GENERATOR
E88B1C
LOOP NO 3
STEAM GENERATOR
E88B1B
LOOP NO. 2
REACTOR COOLANT PUMP
P88B1D
REACTOR COOLANT PUMP
P88B1A
REACTOR COOLANT PUMP
P88B1C
REACTOR COOLANT PUMP
P88B1B
REACTOR VESSEL
RB8B1
NOTES:
REFERENCE:
USAR FIG. 5.1-1-B1
ESSENTIAL DRAWING
WOLF CREEK
ELECTRONIC APPROVAL
PIPING & INSTRUMENTATION DIAGRAM
REACTOR COOLANT SYSTEM
M-12BB01
29

M-12BB02


PRESSURIZER
T8B03
PRESSURIZER RELIEF TANK
T8B02
NOTES:
USAR FIG. 5.1-1-82
ESSENTIAL DRAWING
WOLF CREEK
ELECTRONIC APPROVAL
PIPING & INSTRUMENTATION DIAGRAM
REACTOR COOLANT SYSTEM
M-12BB02
20

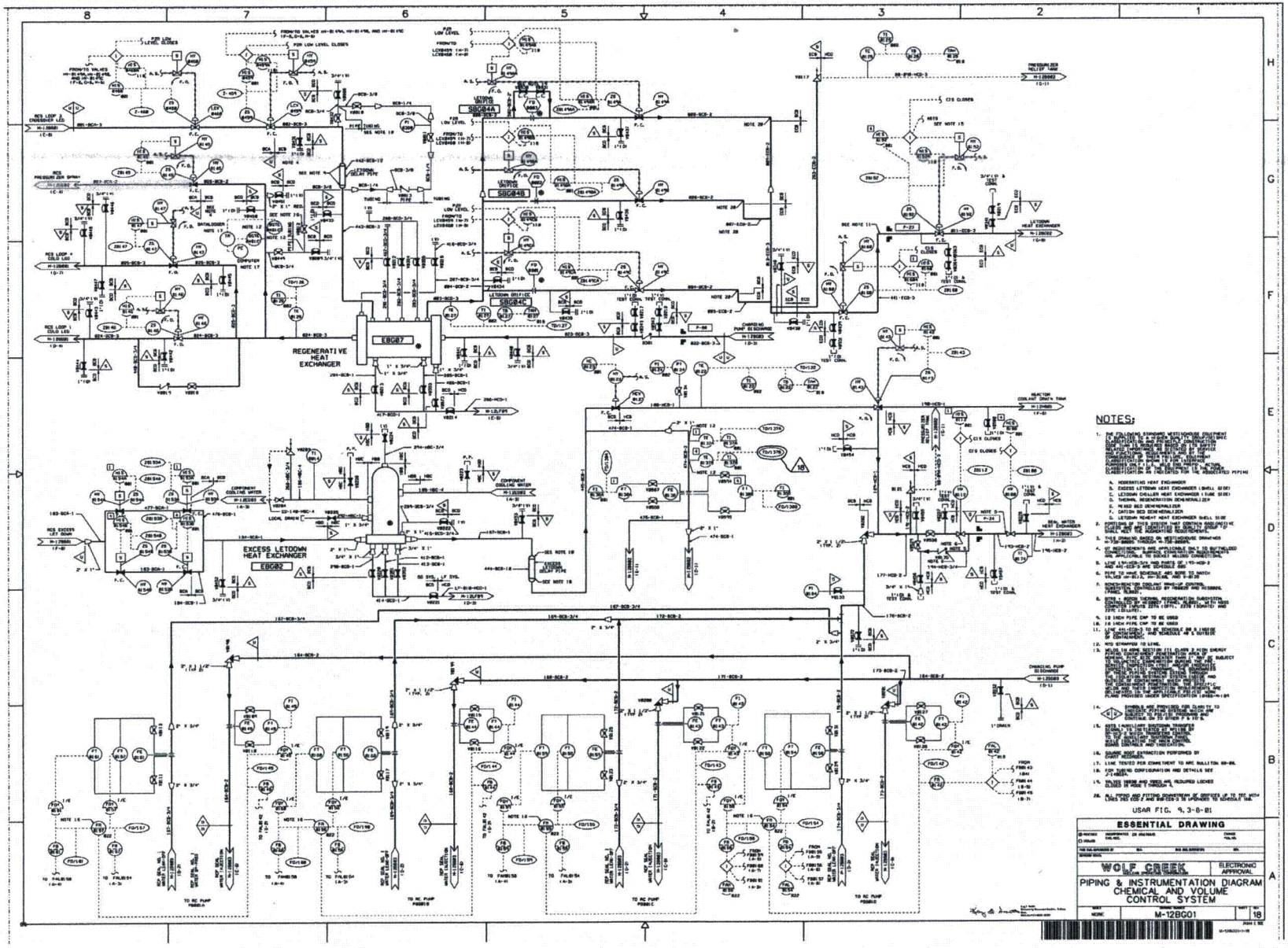
M-BB04



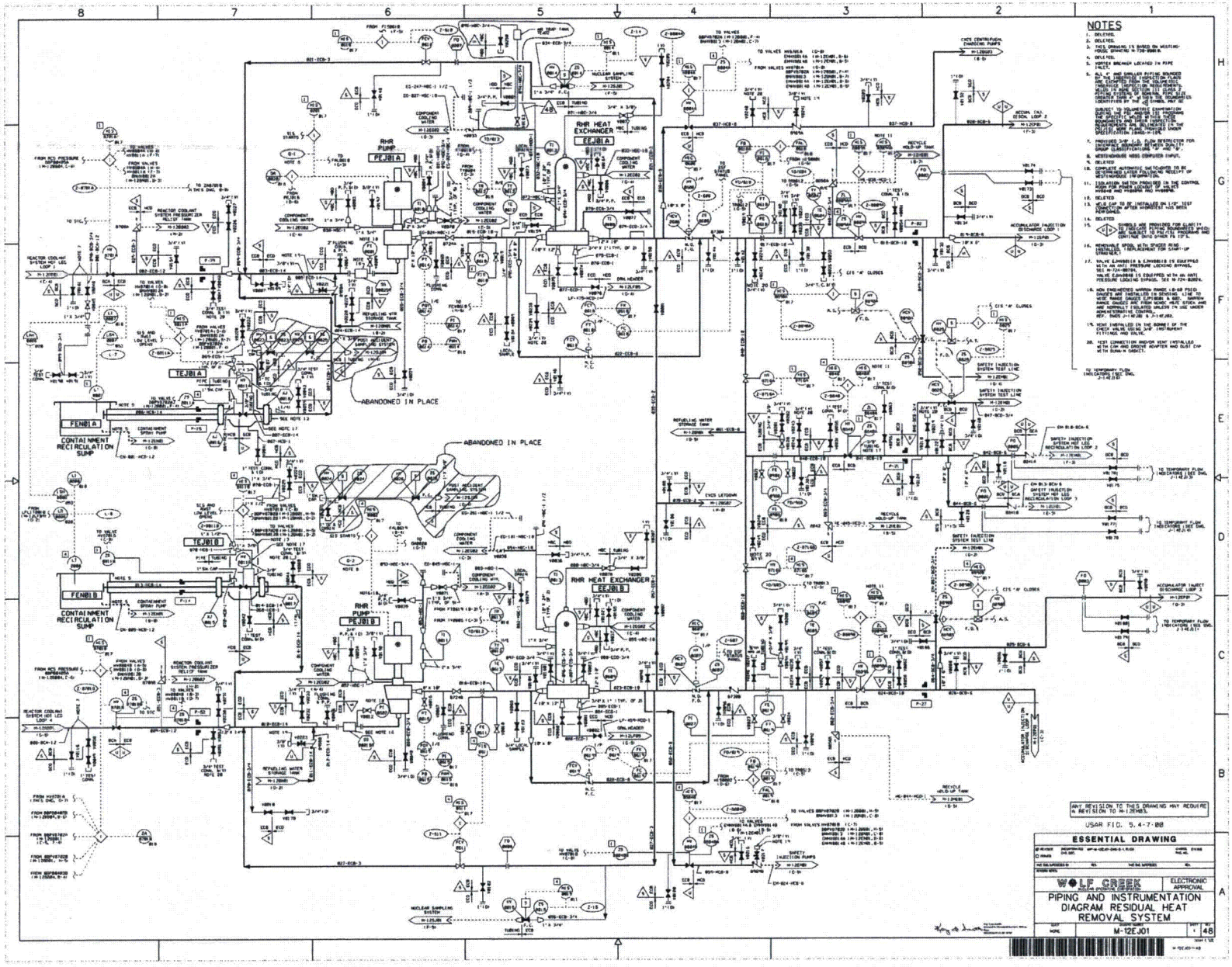
RV CORE SUBCOOLING MONITOR

TRAIN	SEP. GRP.	T/C JUNCT. BOX NO.		T/C NUMBER							PENETRATION NO.
A	1	BB0004A		38	30	33	5	45	41	SPR	75
				48	20	44	47	49	43	SPR	76
				42	39	15	35	13	46	7	77
				31	27	32	29	4	1	SPR	78
B	4	BB0004B		37	9	17	12	36	11	SPR	75
				24	23	19	50	25	22	18	76
				40	16	14	34	10	21	SPR	77
				26	2	8	28	3	6	SPR	78

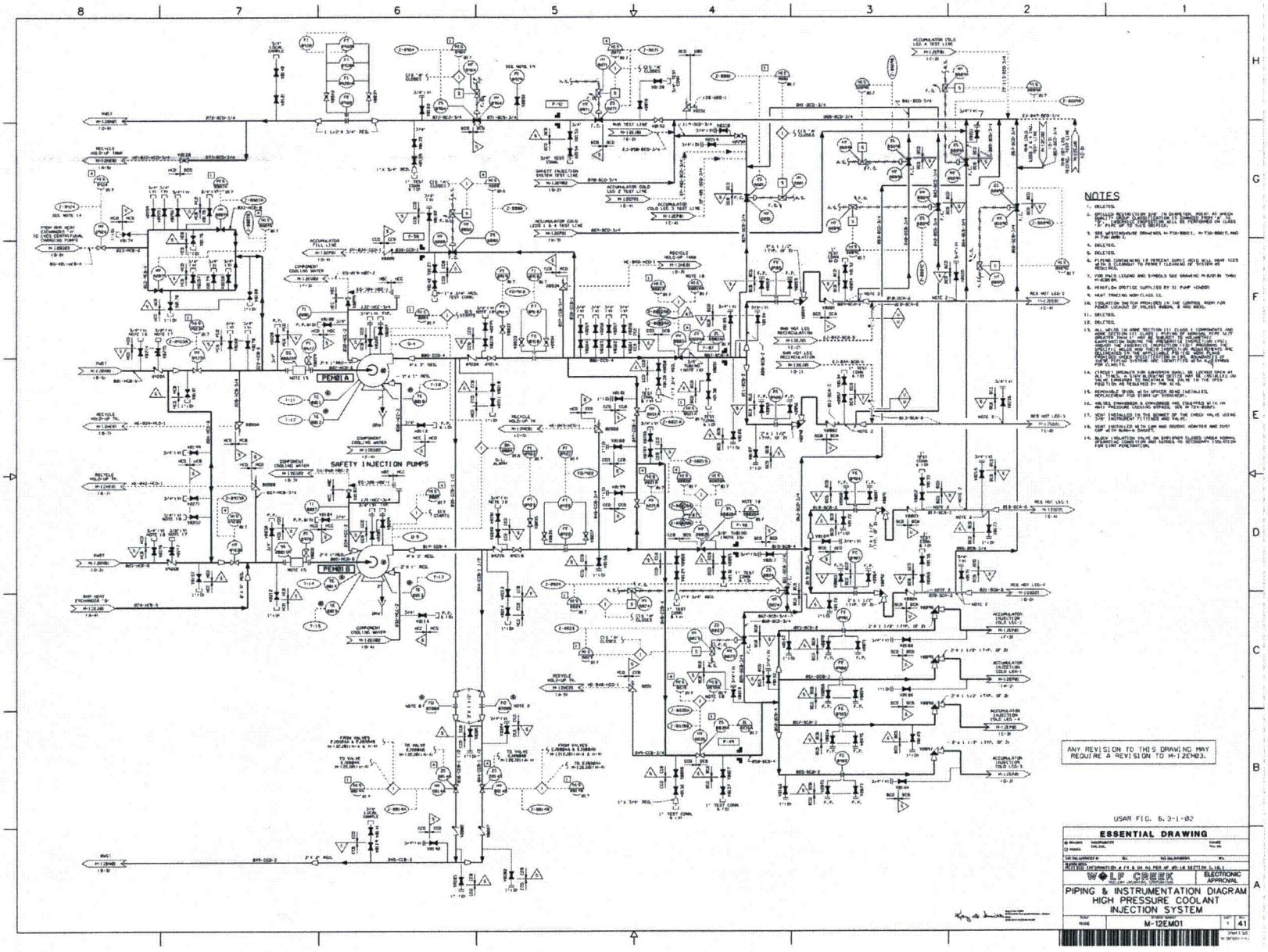
M-12BG01


REGENERATIVE HEAT EXCHANGER
EBG07
EXCESS LETDOWN HEAT EXCHANGER
EBG02
NOTES;
USAR FIG. 9.3-6-B1
ESSENTIAL DRAWING
WOLF CREEK
ELECTRONIC APPROVAL
PIPING & INSTRUMENTATION DIAGRAM
CHEMICAL AND VOLUME
CONTROL SYSTEM
M-12BG01
18

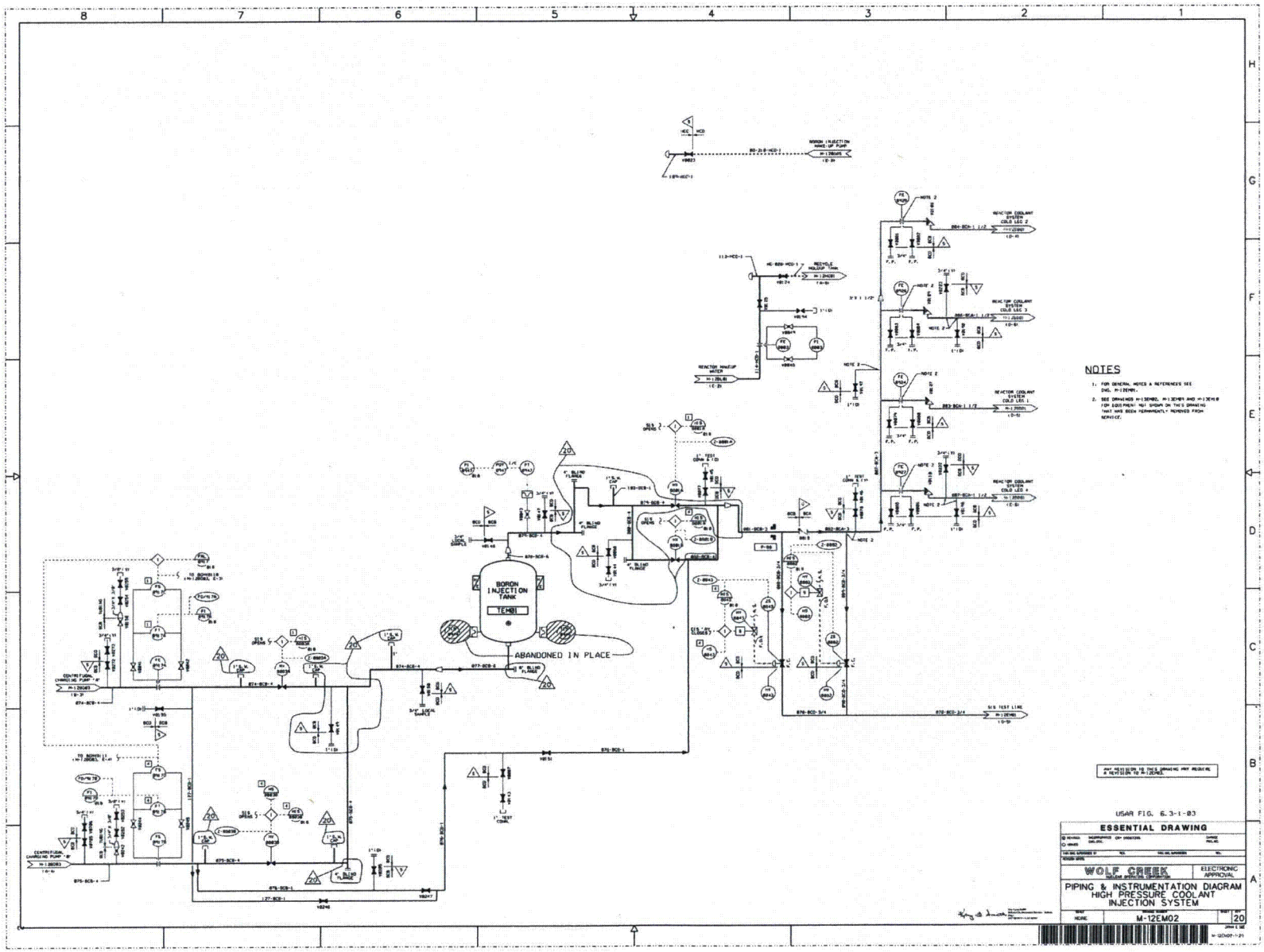
M-12EJ01


NOTES
RHR HEAT EXCHANGER EEJ01A
RHR PUMP PEJ01A
RHR HEAT EXCHANGER EEJ01B
RHR PUMP PEJ01B
TEJ01A
TEJ01B
FENB01A
FENB01B
CONTAINMENT RECIRCULATION SUMP
CONTAINMENT RECIRCULATION SUMP
ABANDONED IN PLACE
ABANDONED IN PLACE
ESSENTIAL DRAWING
WOLF CREEK
ELECTRONIC APPROVAL
PIPING AND INSTRUMENTATION DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM
M-12EJ01
48

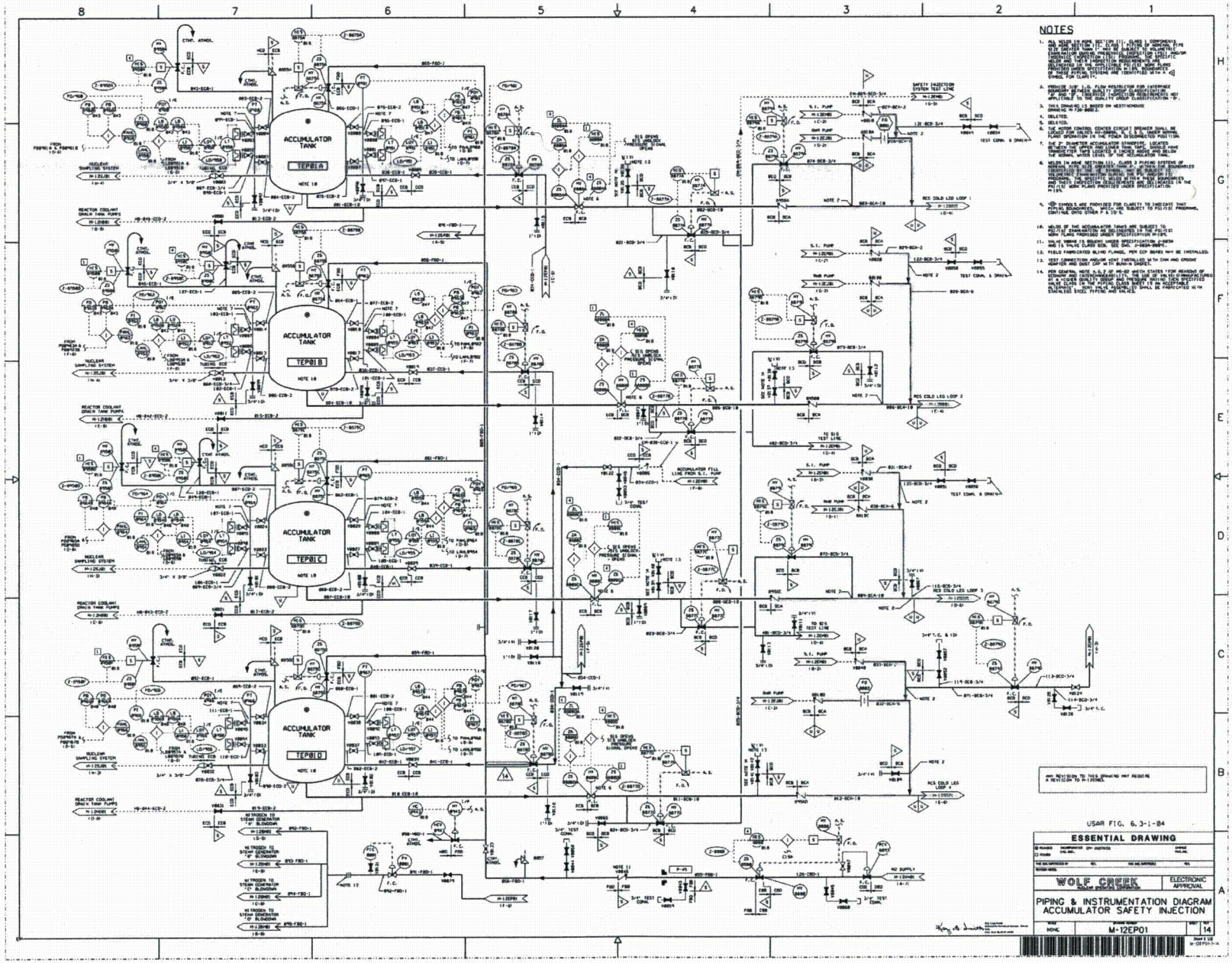
12-EM01


SAFETY INJECTION PUMPS
PEM01A
PEM01B
NOTES
ANY REVISION TO THIS DRAWING MAY REQUIRE A REVISION TO M-12EM03.
USAR FIG. 6.3-1-02
ESSENTIAL DRAWING
WOLF CREEK
PIPING & INSTRUMENTATION DIAGRAM
HIGH PRESSURE COOLANT
INJECTION SYSTEM
M-12EM01

M-12EM02


BORON INJECTION TANK
TEH01
ABANDONED IN PLACE
NOTES
USAR FIG. 6.3-1-03
ESSENTIAL DRAWING
WOLF CREEK
ELECTRONIC APPROVAL
PIPING & INSTRUMENTATION DIAGRAM
HIGH PRESSURE COOLANT
INJECTION SYSTEM
M-12EM02
20

M12-EP01


NOTES
ACCUMULATOR TANK
TEP01A
TEP01B
TEP01C
TEP01D
USAR FIG. 6.3-1-04
ESSENTIAL DRAWING
WOLF CREEK
ELECTRONIC APPROVAL
PIPING & INSTRUMENTATION DIAGRAM
ACCUMULATOR SAFETY INJECTION
M-12EP01
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