UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

October 5, 2009

Kevin Walsh, Vice President, Operations
Entergy Operations, Inc.
Arkansas Nuclear One
1448 S.R. 333
Russellville, AR 72802

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT 2 - NRC EXAMINATION REPORT 05000368/2009302

Dear Mr. Walsh:

On August 14, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an initial operator license examination at Arkansas Nuclear One, Unit 2. The enclosed report documents the examination findings and licensing decisions. The preliminary examination findings were discussed on August 14, 2009, with Ms. Sherrie Cotton, Training Manager, and other members of your staff. A telephonic exit meeting was conducted on August 27, 2009, with Mr. Randal Martin, Operations Training Supervisor, who was provided the NRC licensing decisions.

The examination included the evaluation of seven applicants for reactor operator licenses and eight applicants for upgrade senior reactor operator licenses. The license examiners determined that all of the applicants satisfied the requirements of 10 CFR Part 55, and the appropriate licenses have been issued. There were three post examination comments submitted by your staff. Enclosure 1 contains details of this report and Enclosure 2 summarizes post examination comment resolution.

No findings of significance were identified during this examination.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Ryan E. Lantz, Chief
Operations Branch
Division of Reactor Safety

Docket: 50-368
License: NPF-6

Enclosure: 1. NRC Examination Report 05000368/2009302
2. NRC Post Examination Comment Resolution

cc w/enclosure:
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SUNSI Review Completed: __BTL__ ADAMS: ☒ Yes ☐ No Initials: __BTL__
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SOE:OB	OE:OB	OE:OB (RIII)	C:PBE	C:OB
BLarson	GApger	DReeser	GReplogle	RLantz
/RA/	/RA/			
10/1/09	10/1/09	10/1/09	10/5/09	10/5/09

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket:	50-368
License:	NPF-6
Report:	05000368/2009302
Licensee:	Entergy Operations, Inc.
Facility:	Arkansas Nuclear One, Unit 2
Location:	Junction of Hwy. 64W and Hwy. 333 South Russellville, Arkansas
Dates:	August 7-27, 2009
Inspectors:	B. Larson, Senior Operations Engineer T. McKernon, Senior Operations Engineer G. Apger, Operations Engineer D. Reeser, Operations Engineer
Approved By:	Ryan Lantz, Chief Operations Branch Division of Reactor Safety

SUMMARY OF FINDINGS

ER05000368/2009302; August 7, 2009; Arkansas Nuclear One, Unit 2; Initial Operator Licensing Examination Report.

NRC examiners evaluated the competency of seven applicants for reactor operator licenses, one applicant for instant senior reactor operator license and seven applicants for upgrade senior reactor operator licenses at Arkansas Nuclear One, Unit 2.

The licensee developed the examinations using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9, Supplement 1. The written examination was administered by the licensee on August 7, 2009. NRC examiners administered the operating tests on August 10-14, 2009.

The examiners determined that all of the applicants satisfied the requirements of 10 CFR Part 55, and the appropriate licenses have been issued.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violations

None.

REPORT DETAILS

4. OTHER ACTIVITIES (OA)

4OA5 Other Activities (Initial Operator License Examination)

.1 License Applications

a. Scope

NRC examiners reviewed all license applications submitted to ensure each applicant satisfied relevant license eligibility requirements. The examiners also audited three of the license applications in detail to confirm that they accurately reflected the subject applicant's qualifications. This audit focused on the applicant's experience and on-the-job training, including control manipulations that provided significant reactivity changes.

b. Findings

No findings of significance were identified.

.2 Examination Development

a. Scope

NRC examiners reviewed integrated examination outlines and draft examinations submitted by the licensee against the requirements of NUREG-1021. The NRC examination team conducted an onsite validation of the operating tests.

b. Findings

NRC examiners provided outline, draft examination and post-validation comments to the licensee. The licensee satisfactorily completed comment resolution prior to examination administration.

NRC examiners determined that the written examinations and operating tests initially submitted by the licensee were within the range of acceptability expected for a proposed examination.

.3 Operator Knowledge and Performance

a. Scope

On August 7, 2009, the licensee proctored the administration of the written examinations to all fifteen applicants. The licensee staff graded the written examinations, analyzed the results, and presented their analysis and post examination comments to the NRC on August 18, 2009.

The NRC examination team administered the various portions of the operating tests to

b. Findings

No findings of significance were identified.

All of the applicants passed the written examination and all parts of the operating test. The final written examinations and post-examination analysis and comments may be accessed in the ADAMS system under the accession numbers noted in the attachment.

.4 Simulation Facility Performance

a. Scope

The NRC examiners observed simulator performance with regard to plant fidelity during examination validation and administration.

b. Findings

No findings of significance were identified.

.5 Examination Security

a. Scope

The NRC examiners reviewed examination security during both the onsite preparation week and examination administration week for compliance with 10 CFR 55.49 and NUREG-1021. Plans for simulator security and applicant control were reviewed and discussed with licensee personnel.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

The chief examiner presented the preliminary examination results to Ms. Sherrie Cotton, Training Manager, Mr. Randall Walters, Operations Manager, and other members of the staff on August 14, 2009. A telephonic exit was conducted on August 27, 2009, between Messrs. Brian Larson, Chief Examiner, and Randal Martin, Operations Training Supervisor.

The licensee did not identify any information or materials used during the examination as proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
Clay Simpson, Operations Training Supervisor
Bill Coble, Operations Training
Zac Lacy, Operations Training
Brad Wooten, Operations Training

NRC Personnel
J. Josey, Resident Inspector
J. Rotton, Resident Inspector

ADAMS DOCUMENTS REFERENCED

Accession No. ML092660895 - FINAL WRITTEN EXAMS
Accession No. ML092660900 - POST EXAM ANALYSIS-COMMENTS

NRC Resolution to the Arkansas Nuclear One, Unit 2 Post Examination Comments

A complete text of the licensee's post examination analysis and comments can be found in ADAMS under Accession Number ML092660900.

RO QUESTION # 7

COMMENT: ***Based on exam analysis, this question was determined to have two correct answers.*** There were no student questions logged for this question during the exam. Distracters 'A' and 'B' are incorrect because the liquid temperature is in a P-Sat/T-Sat condition and will lower as pressure is reduced. Initially as the spray valve comes open the relatively cool water from the RCS will spray the steam bubble causing condensation of the steam which then becomes part of the liquid. Condensing the steam also lowers temperature and pressure. This lower pressure causes the warmer water to evaporate to steam to counteract the drop in pressure. The steam and liquid end up in a lower pressure equilibrium saturated pressure and temperature. The stem asked what would happen to the bulk liquid temperature and why.

Based on the above, distracters 'C' and 'D' are correct. Recommend accepting 'C' and 'D' as a correct answer. This question will be modified as required so that only one answer will be correct.

NRC RESOLUTION: The stem of the question provides initial conditions that the plant is shutdown with the Pressurizer in a steady state Psat/Tsat condition (1400 psia/587°F). Subsequently, the in-service spray valve opens and Pressurizer pressure begins to lower. When pressure reaches 1200 psia, the spray valve closes. The question then asks if the pressurizer bulk liquid temperature has risen or lowered and whether the change was due to evaporation of liquid or condensation of vapor.

The original answer was 'C' - bulk liquid temperature had lowered due to evaporation of liquid. The effect of the spray of relatively cooler water into the Pressurizer steam space causes Pressurizer pressure to lower and initiates the evaporation of the bulk liquid. This is the direct component of the temperature decrease. However, as stated by the licensee post-examination comment, condensed steam at some lower temperature than the bulk liquid does combine with the bulk liquid and theoretically presents a very minor component for bulk liquid temperature decrease. It is also correct that the bulk liquid temperature reduction would not have occurred without the effect of condensation of the steam bubble. Since the stem of the question does not differentiate between major/minor components of temperature change or cause/effect relationships, the NRC concurs with the licensee recommendation of accepting both 'C' and 'D' as correct answers.

RO QUESTION # 28

COMMENT: ***Based on exam analysis, this question was determined to have two correct answers.*** There was one applicant that asked "What is the time frame for the changes taking place in this question?" The proctor read the initial conditions of the question to the applicant. The stem asked based on the initial conditions, why are CETs used to provide a calculation to Margin to Saturation (MTS)? The initial conditions placed the plant in natural circulation. In natural circulation, CETs are always used for MTS calculation due to the lower flow past the Thot and Tcold RTDs.

Recommend accepting ‘C’ and ‘D’ as correct answers. This question will be modified as required so that only one answer will be correct.

NRC RESOLUTION: The stem of the question provides initial conditions that the plant had tripped from full power with an immediate 2°F delta between Tcold and Thot. It then states 15 minutes after the trip, offsite power is lost. The question then asks whether RCS Tave will rise or lower and the reason Core Exit Thermocouples (CETs) are used for calculation of Margin to Saturation (MTS) based on these conditions.

The original answer was 'D' – RCS Tave will rise and CETs are used because lower flow past the RCS Thot and Tcold RTDs could cause an error in MTS calculation. The distractor 'C' was evaluated as not correct since CETs are not always used for MTS calculation (RTDs are used for MTS calculation when Reactor Coolant Pumps (RCPs) are operating). However, as stated in the licensee post-examination comment, the given loss of offsite power placed the plant in natural circulation (RCPs are solely supplied from offsite power). Thus, based on the conditions given in the stem (natural circulation), distractor 'C' is also correct since CETs are always used for MTS calculation during natural circulation. The NRC concurs with the licensee recommendation of accepting both 'C' and 'D' as correct answers.

RO QUESTION # 39

COMMENT: ***Question had an 86.67% (13/15) failure rate and based on exam analysis, this question was determined to have two correct answers.*** There was only one applicant question logged during the exam for this QID. The alarm in distracter ‘D’ will come in on a malfunction of the Main Chill Water pump as will the alarm in answer ‘C’ due to low chill water flow in the Containment cooling coils.

Because the stem of the question asks for confirmation of the pump malfunction and not confirmation of loss of flow to Containment, both ‘C’ and ‘D’ are correct. This question will be modified as required so that only one answer will be correct.

NRC RESOLUTION: The stem of the question provides initial conditions that the plant is at full power with three of four containment cooling fans in service. The question then asks what alarm would be the MOST DIRECT confirmation of a loss or malfunction of the containment cooling water supply pump.

At full power, cooling water for the Containment Cooling System (CCS) coils is supplied from the Main Chilled Water system. Service water will only supply the CCS fans on a Safety Injection Actuation or Main Steam Isolation signal. Component Cooling Water (CCW) supplies cooling water to the RCPs in containment.

The original answer was 'C' - this alarm only comes in on low chill water flow to the containment cooling coils. Distracter D was considered incorrect because this alarm will come in on loss of flow in Main Chill Water, Aux Extension Chill Water, or Control Room Chill Water Systems. Thus, this alarm could indicate a loss of a pump that does not supply the containment coolers and would not therefore be the MOST DIRECT confirmation. Given the ambiguity of the term 'most direct' and the fact that a loss or malfunction of the Main Chilled Water pump would cause the "Chilled Water Flow Low" annunciator, the NRC concurs with the licensee recommendation of accepting both 'C' and 'D' as correct answers.