



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931**

April 25, 2002

Virginia Electric and Power Company
ATTN: Mr. David A. Christian
Sr. Vice President and
Chief Nuclear Officer
Innsbrook Technical Center - 2SW
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

**SUBJECT: SURRY NUCLEAR POWER STATION - NRC INTEGRATED INSPECTION
REPORT NOS. 50-280/01-05 AND 50-281/01-05**

On March 30, 2002, the NRC completed an inspection at your Surry Power Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on April 10, 2002, with Mr. Blount and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selective procedures and records, observed activities, and interviewed personnel.

No findings of significance were identified by the NRC.

In accordance with 10 CFR 2.790 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/

Kerry D. Landis, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-280, 50-281
License Nos.: DPR-32, DPR-37

Enclosure: Integrated Inspection Report

cc w/encls.: See page 2

cc w/encls.:

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DATE	4/25/2002	4/25/2002	4/25/2002	4/24/2002	4/24/2002	4/23/2002	4/25/2002
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
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E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-280, 50-281
License Nos.: DPR-32, DPR-37

Report No.: 50-280/01-05, 50-281/01-05

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: Surry Power Station, Units 1 & 2

Location: 5850 Hog Island Road
Surry, VA 23883

Dates: December 30, 2001 - March 30, 2002

Inspectors: R. Musser, Senior Resident Inspector
G. McCoy, Resident Inspector
K. Poertner, Resident Inspector
M. Morgan, Senior Resident Inspector, North Anna (part Section 1R05)
J. Canady, Resident Inspector, North Anna (part Section 1R04.1)
R. Chou, Reactor Inspector (Section 1R07)
L. Garner, Senior Project Engineer (Section 1R04.2)
K. Green-Bates, Project Engineer (part Section 1R22)

Approved by: K. Landis, Chief, Reactor Projects Branch 5
Division of Reactor Projects

Attachment: Supplemental Information

Enclosure

SUMMARY OF FINDINGS

IR 05000280-01-05, IR 05000281-01-05, on 12/30/2001 - 3/30/2002; Virginia Electric and Power Co.; Surry Power Station Units 1 & 2. Resident Inspector Integrated Report.

The inspection was conducted by resident inspectors, a reactor inspector, a project engineer and a senior project engineer. No findings of significance were identified. The significance of findings is indicated by its color (Green, White, Yellow, Red) using IMC 0609 "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at <http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/index.html>.

A. Inspector Identified Findings

None

B. Licensee Identified Violations

None

Report Details

Summary of Plant Status

Unit 1 operated at power the entire reporting period. On March 1 Unit 1 power was reduced to 60 percent to repair of the B feedwater pump (1-FW-P-1B) and the B low pressure heater drain pump (1-SD-P-2B). On March 2 Unit 1 was returned to 100 percent power.

Unit 2 operated at power until March 24 when the unit was shutdown for a scheduled refueling outage. The unit remained shutdown for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignment

.1 Partial System Walkdowns

a. Inspection Scope

For the systems identified below, the inspectors reviewed plant documents to determine correct system lineup, and observed equipment to verify that the system was correctly aligned:

- Unit 1 and Unit 2 turbine driven auxiliary feedwater pump and flowpath (1-OP-FW-001A, "Auxiliary Feedwater System Valve Alignment," 2-OP-FW-001A, "Auxiliary Feedwater System Valve Alignment") while the alternate AC diesel was out of service for maintenance;
- Uninterruptible power supplies (UPS) 1A-1, 1A-2, and 1B-1 (1-MOP-EP-001, 002, 003, "Removal from Service and Return to Service of UPS 1A-1(1A-2)(1B-1) Components") while the 1B-2 UPS was out of service for maintenance; and,
- Auxiliary ventilation exhaust filter train 1-VS-F-58A, (0-OP-VS-002, "Auxiliary Building Ventilation System") while the 1-VS-F-58B train was out of service for maintenance.

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors performed a walkdown and inspection of the Unit 1 high head safety injection portion of the chemical and volume control system to determine if it was properly aligned and to identify discrepancies that impact its availability and functional capability. Specifically, the walkdown included the accessible system components from the volume control tank outlet isolation valves and the refueling water storage tank to

the containment boundary, as well as, the component cooling and service water subsystems for the charging pumps. The inspectors examined and assessed the material condition of pumps, valves, pipes and pipe supports, conduits and conduit supports, electrical switchgear, motor control centers, ventilation components and instrumentation. Proper equipment labeling and valve alignment were determined from the documents listed in the Attachment and availability of electric power was determined by the equipment being in operation or from breaker positions and other available indications.

The inspectors reviewed outstanding work requests, the January, February and March 2002 predictive analysis equipment status reports and recent component functional test data, and held discussions with engineering personnel concerning design items and issues to determine if problems were being appropriately evaluated and scheduled for resolution. The inspectors also reviewed corrective action documents issued in the previous year for equipment alignment problems.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Area Walkdowns

a. Inspection Scope

The inspectors conducted tours of the following areas to assess the adequacy of the fire protection program implementation. The inspectors checked for the control of transient combustibles and the condition of the fire detection and fire suppression systems (using "SPS Appendix R Report") in the following areas:

- Unit 1 cable vault;
- Unit 2 cable vault;
- Unit 1 cable spreading room;
- Unit 1 safeguards and main steam valve house;
- Unit 1B battery room; and,
- Number 1 emergency diesel generator room.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (Biennial)

a. Inspection Scope

The inspectors selected the following four risk important heat exchangers or heat sinks and associated components to inspect: control room chillers, component cooling heat exchangers, charging pump seal coolers, and recirculation spray heat exchangers. The

inspectors used accepted industry standards (Electric Power Research Institute Service Water Heat Exchanger Testing Guidelines, TR-107397) or equivalent (NRC Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment") for guidelines. The inspectors observed surveillance or maintenance performance for heat sink components and reviewed documents for heat exchangers to determine if the licensee's activities were consistent with NRC Generic Letter 89-13. The inspectors also walked down the service water high and low level intake structures, pumps, piping, and diesel emergency service water pumps at the intake canal and river to evaluate the component conditions.

The inspectors observed performance checks of chill water temperature, chiller oil pressure, oil level, and temperature setpoint or ranges for Control Room Chillers 1-VS-E-4B and 1-VS-E-4E. The inspectors observed cleaning, brushing, and welding for the inlet and outlet of the Component Cooling Heat Exchanger 1-CC-E-1C endbells. The inspectors also reviewed associated documents during the observation.

The inspectors reviewed selected documents associated with the Charging Pump 1B Seal Cooler 01-CH-E-7C, Recirculation Spray Heat Exchangers 2-RS-E-1A and 2-RS-E-1D, Component Cooling Heat Exchangers 1-CC-E-1A and 1-CC-E-1B, and Control Room Chillers 1-VS-E-4D and 1-VS-E-4E. The documents reviewed included a failure analysis report and procedures and work orders for maintenance, inspection, cleaning, repair, replacement, functional or performance testing, post maintenance testing, flow testing, coating, tubesheet cleaning, tube scraping, and measurement of macrofouling blockage. The documents are listed in the Attachment.

The inspectors reviewed the documents to determine that: selected heat exchanger testing was adequate; test criteria were appropriate and met; test frequency was appropriate; and test results were acceptable. These reviews were evaluated using Technical Specifications, the Updated Final Safety Analysis Report, and Generic Letter 89-13.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspections Scope

The inspectors observed licensed operator performance during simulator training session RQ-02-ST-2, "Loss of Instrument Air" to determine whether the operators:

- were familiar with and could successfully implement the procedures associated with recognizing and recovering from a loss of instrument air;
- recognized the high-risk actions in those procedures; and,
- were familiar with related industry operating experiences.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

For the equipment issues described in the plant issues listed below, the inspectors reviewed the licensee's implementation of the Maintenance Rule (10 CFR 50.65) using VPAP 0815, "Maintenance Rule Program," and the Surry Maintenance Rule Scoping and Performance Criteria Matrix, with respect to the characterization of failures, the appropriateness of the associated a(1) or a(2) classification, and the appropriateness of either the associated a(2) performance criteria or the associated a(1) goals and corrective actions:

- S-2001-3566, Solenoid valve 2-RC-SOV-200B-2 declared inoperable;
- S-2001-3461, Number 2 emergency diesel generator (EDG) field would not flash;
- S-2001-3701, Chill water pump 1-VS-P-2D coupling sheared;
- S-2002-0114, Main steam line pressure indication failure, making the steam; generator power operated relief valve inoperable;
- S-2002-0553, Throughwall leak on service water 1-SW-TI-109E thermowell; and,
- S-2002-0232, Boric acid transfer pump 1-CH-P-2B inoperable due to low discharge pressure.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluations

a. Inspection Scope

The inspectors verified the adequacy, accuracy, and completeness of plant risk assessments performed prior to any changes in plant configuration for maintenance activities or in response to emergent conditions. When applicable, inspectors verified the licensee entered the appropriate risk category in accordance with plant procedures. Specifically, the inspectors reviewed:

- Simultaneous removal of Unit 1 B instrument air compressor (1-IA-C-4B), B emergency service water pump (1-SW-P-1B), A central AC water chiller (1-VS-E-3A), A control room chiller (1-VS-E-4A) and B safety related filtered exhaust fan (1-VS-F-58B) with valve 1-RH-MOV-1720A inoperable;
- Simultaneous removal from service of Unit 1 A bearing cooling heat exchanger (1-BC-E-1A), Unit 1 B containment instrument air compressor (1-IA-C-4B), A component cooling pump (1-CC-P-1A), Unit 1 C charging pump (1-CH-P-1C), A control room chiller (1-VS-E-4A), A safety related filtered exhaust fan (1-VS-F-

- 58A) and C emergency service water pump (1-SW-P-1C) with valve 1-RH-MOV-1720A inoperable;
- Simultaneous removal from service of A component cooling heat exchanger (1-CC-E-1A), B boric acid transfer pump (1-CH-P-2B), B component cooling pump (1-CC-P-1B), Unit 1 B containment instrument air dryer (1-IA-D-4B), Unit 2 B bearing cooling heat exchanger (2-BC-E-1B), and number 2 emergency diesel generator (2-EE-EG-1), a failure of the inverter for Unit 1 AMSAC panel (1-AMS-PNL-01), individual isolation of the Unit 2 steam dumps (2-MS-21, 2-MS-61), with valve 1-RH-MOV-1720A inoperable;
- Simultaneous removal from service of Unit 2 B bearing cooling pump (2-BC-P-1B), D component cooling heat exchanger (1-CC-E-1D), Unit 2 A charging pump (2-CH-P-1A) and Unit 2 AMSAC system (2-AMS-PNL-01) with valve 1-RH-MOV-1720A inoperable;
- Simultaneous removal from service of Unit 2 H stub bus, Unit 2 A containment instrument air compressor (2-IA-C-4A), 230kv switchyard switching activity, Unit 1 main feedwater regulating valve testing, with valve 1-RH-MOV-1720A inoperable; and,
- Risk significance to Unit 1 (Unit 2 was shutdown) of the simultaneous removal from service of the number 2 transformer, B reserve station transformer, Unit 2 turbine driven auxiliary feedwater pump (2-FW-P-2), Unit 2 H bus breakers out of service for logic testing, switching activities in the switchyard with valve 1-RH-MOV-1720A inoperable.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors evaluated the technical adequacy of the operability evaluations to ensure that operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The operability evaluations were described in the engineering transmittal (ET) or plant issue listed below:

- ET S-2002-0026, Emergency diesel generator minimum lube oil temperature for 10 second start criteria;
- Plant issue S-2002-264, Failure of the manual transfer switch on uninterruptable power supply 1A1 (1-EP-UPS-1A-1);
- Plant issues S-2002-194, S-2002-198, and S-2002-205, Simultaneous failures of A and B spent fuel cooling pumps (1-FC-P-1A and 1-FC-P-1B);
- Plant issue S-2002-0567, DC bus separation; and,
- Plant issue S-2002-0177, Review of MOV test data.

b. Findings

No findings of significance were identified.

1R16 Operator Workaroundsa. Inspection Scope

The inspectors reviewed the licensee's list of identified operator workarounds dated February 22, 2002. The inspectors reviewed the cumulative effects of operator workarounds on: the reliability, availability and potential for misoperation of any plant system; the frequency of initiating events; and the ability of operators to respond in a correct and timely manner to plant transients and accidents.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testinga. Inspection Scope

The inspectors reviewed the following post maintenance test procedures and activities associated with the repair or replacement of components to determine that they were adequate to verify operability and functional capability following maintenance:

- 2-MOP-EP-003, Return to service testing of uninterruptible power supply 2B1;
- WO 457963-01, Replacement of mechanical seals on pump 1-CC-P-1A;
- WO 464564-01, Lubrication and Inspection of Limitorque operator on valve 2-FW-MOV-260B;
- WO 466566-01, Control valve 1-IA-PCV-100 Adjustment;
- WO 463889-01, Breaker 25J10 protection relay work; and,
- WO 466351-01, Replace number 2 EDG cooling water immersion heater temperature switch.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (Unit 2)a. Inspection Scope

With respect to the Unit 2 refueling outage that began on March 24, 2002, and continued through the end of the report period, the inspectors used inspection procedure 71111.20, "Refueling and Outage Activities" to complete the inspections described below.

Prior to (and during) the outage, the inspectors reviewed the licensee's outage risk control plan ("Unit 2 2002 Refueling Outage Safety Assessment," and VPAP-2805, "Shutdown Risk Program") to verify that the licensee had appropriately considered risk,

industry experience and previous site specific problems, and to confirm that the licensee had mitigation/response strategies for losses of key safety functions.

During the cooldown which preceded the outage, the inspectors reviewed portions of the cooldown process to verify that technical specification cooldown restrictions were followed.

The inspectors confirmed that, when the licensee removed equipment from service, the licensee maintained defense-in-depth commensurate with the outage risk control plan for key safety functions and applicable technical specifications, and that configuration changes due to emergent work and unexpected conditions were controlled in accordance with the outage risk control plan.

During the outage, the inspectors:

- Reviewed reactor coolant system (RCS) pressure, level, and temperature instruments to verify that those instruments were installed and configured to provide accurate indication; and that instrumentation error was accounted for;
- Reviewed the status and configuration of electrical systems to verify that those systems met technical specification requirements and the licensee's outage risk control plan;
- Observed decay heat removal parameters to verify that the system was properly functioning;
- Reviewed system alignments to verify that the flow paths, configurations, and alternative means for inventory addition were consistent with the outage risk plan;
- Reviewed selected control room operations to verify that the licensee was controlling reactivity in accordance with the technical specifications; and,
- Reviewed the outage risk plan to verify that activities, systems, and/or components which could cause unexpected reactivity changes were identified in the outage risk plan and were controlled accordingly.

The inspectors reviewed the licensee's plans for changing plant configurations to verify on a sampling basis that technical specifications, license conditions, and other requirements, commitments, and administrative procedure prerequisites were met prior to changing plant configurations. The inspectors reviewed RCS boundary leakage and the setting of containment integrity.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the surveillance tests listed below, the inspectors examined the test procedure and either witnessed the testing and/or reviewed test records to determine whether the

scope of testing adequately demonstrated that the affected equipment was functional and operable:

- 2-IPT-FT-SI-001A, "Train A Safeguards Actuation Logic Functional Test,"
- 2-IPT-FT-CW-L-202/203, "Low Intake Canal Level Trip Switches Quarterly Functional Test;"
- 1-OPT-EG-001, "Number 1 Emergency Diesel Generator Monthly Start Exercise Test;"
- 1-OPT-FW-001, "Motor Driven Auxiliary Feedwater Pump 1-FW-P-3A Performance Test;"
- 2-OPT-EG-001, "Number 2 Emergency Diesel Generator Monthly Start Exercise Test;" and,
- 1-OPT-EG-005, "Number 1 Emergency Diesel Generator Fuel Oil System Tests."

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed Temporary Modification 01-02-003, "Temporary instrumentation to measure operation of EDG heater," to determine whether system operability / availability was affected, that configuration control was maintained, and that the associated safety evaluation adequately justified implementation.

b. Findings

No findings of significance were identified.

4 OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Review

.1 Unplanned Scrams PI

a. Inspection Scope

The inspectors completed a review of the Unit 1 and Unit 2 Unplanned Scrams PI data for the period between January 1, 2001, and December 31, 2001. The inspectors verified the PI data accuracy and completeness against the guidance of NEI 99-02, "Regulatory Assessment Performance Indicator Guideline." Documentation reviewed included Operator Logs, Licensee Event Reports, and Monthly Operating Reports.

b. Findings

No findings of significance were identified.

.2 Safety System Functional Failures PI

a. Inspection Scope

The inspectors completed a review of the Unit 1 and Unit 2 Safety System Functional Failures PI data for the period between January 1, 2001, and December 31, 2001. The inspectors verified the PI data accuracy and completeness against the guidance of NEI 99-02, "Regulatory Assessment Performance Indicator Guideline." Documentation reviewed included Operator Logs, Licensee Maintenance Rule Data Base, Licensee Event Reports, and Monthly Operating Reports.

b. Findings

No findings of significance were identified.

4OA6 Management Meetings

.1 Exit Meeting

The inspectors presented the inspection results to members of licensee management on April 10, 2002. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Annual Assessment Meeting Summary

On March 20, 2002, the NRC Chief of Reactor Projects Branch 5 and the Senior Resident Inspector met with Virginia Electric and Power Company to discuss the NRC's Reactor Oversight Process (ROP) and the Surry Power Station annual assessment of safety performance for the period of April 1, 2001 - December 31, 2001. The major topics addressed were: the NRC's assessment program, the results of the Surry Power Station assessment, and the NRC's Agency Action Matrix. Attendees included Surry Power Station site management, members of site staff, and a member of the public.

This meeting was open to the public. Information used for the discussions of the ROP is available from the NRC's document system (ADAMS) as accession number ML020600179. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

NRC

K. Landis, Chief, Branch 5, Division of Reactor Projects, Region II

Licensee

M. Adams, Manager, Engineering
R. Allen, Manager, Maintenance
R. Blount, Site Vice President
B. Foster, Director, Nuclear Station Safety and Licensing
D. Llewellyn, Manager, Training
M. Small, Supervisor, Licensing
T. Sowers, Director, Nuclear Station Operations and Maintenance
T. Steed, Manager, Radiological Protection
J. Swientoniewski, Manager, Operations

ITEMS OPENED, CLOSED, AND DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

Section 1R04.2

Procedures and other documents:

1-OP-CH-001, "CVCS Operations"
1-OP-CH-001A, "CVCS System Alignment"
1-OP-CH-004, "Charging Pump C Operations"
1-OP-51.5A, "Charging Pump CC & SW Systems Valve Alignment"
1-E-0, "Reactor Trip or Safety Injection"
ECA1.1, "Loss of Emergency Coolant Recirculation"
Updated Final Safety Analysis Report Chapter 6
Nuclear Control Room Operator Development (NCRODP)-52, "Safety Injection System"
NCRODP-13, "Service Water System"
NCRODP-51, "Component Cooling System"

Drawings:

11448-FM-071B and -071D, Circulating and Service Water System
11448-FM-084A, Containment Spray System
11448-FM-088B and -088C, Chemical and Volume Control System
11448-FM-089A and -089B, Safety Injection System

Section 1R07Procedures:

VPAP-0811, "Service Water System Inspection and Maintenance Program"
0-MPM-1901-01, "High Level Intake Structure Screenwells and Associated Piping"
0-MPM-1901-02 and -03, "Low Level Intake Structure Screenwells Service Water"
0-MCM-0812-01, "Bearing Cooling and Component Cooling Heat Exchanger Cleaning"
2-OSP-SW-007, "Service Water Flow Test of Recirculation Spray Heat Exchangers 2-RS-E-1A and 2-RS-E-1D," performed on April 26, 1996
0-MCM-0802-01, "Recirculation Spray Heat Exchanger Inspection and Cleaning," performed on October 26, 1994
1-OSP-SW-002, "Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger 1-CC-E-1A," performed on February 9, 2002 (Work Order 459578-01)
1-OSP-SW-003, "Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger 1-CC-E-1B," performed on February 17, 2002
1-FDTP-90-08-3-1, "MER-5 Chiller Installation - Functional Testing of 1-VS-E-4D and 1-VS-E-4E," performed on November 17, 1993
0-MPM-0210-01, "Control Room Chillers Performance Checks for 1-VS-E-4B and 1-VS-E-4E," performed on February 20, 2002
VPAP-0903, Attachment 8, "Base Metal Repair/Weld Repair/Cutout Instruction Sheet For 1-CC-E-1C Inlet and Outlet," under Work Order 00461517-02 on February 20, 2002

Other Documents:

Work Order 00329470-01 for 02-RS-E-1D
Evaluation Requests MM-98-069 and MM-01-041
Work Orders 00419141-01, 004239494-01, and 00429141-02 for 01-CC-E-1A
Material Engineering Laboratory Report NESML-Q-214, "Failure Analysis Report for Heat Exchanger 1-VS-E-4E," July 14, 1995
Drawing: Figure 12-5-S, Circulating Water System
Work Order 00461517-02 for 01-CC-E-1C
Work Orders 00266565-01 and 00439832-01 for 01-CH-E-7C