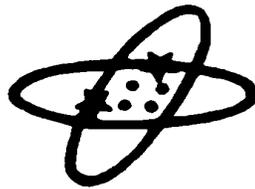


# CHAPTER 32



## ELECTRONICS TECHNICIAN (ET)

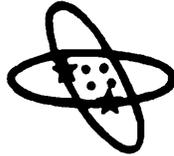
NAVPERS 18068-32I  
CH-70

Updated: April 2017

TABLE OF CONTENTS  
ELECTRONICS TECHNICIAN, NUCLEAR POWER (ETN)

<b>SCOPE OF RATING</b>	ETN-3
<b>GENERAL INFORMATION</b>	ETN-4
<b>SUBMARINE REACTOR CONTROLS OPERATOR</b>	ETN-5
INSTRUMENTATION AND CONTROLS MAINTENANCE	ETN-5
RADIOLOGICAL CONTROL	ETN-6
REACTOR PLANT SYSTEMS	ETN-6
TECHNICAL ADMINISTRATION	ETN-7
<b>SURFACE REACTOR CONTROLS OPERATOR</b>	ETN-8
INSTRUMENTATION AND CONTROLS MAINTENANCE	ETN-8
RADIOLOGICAL CONTROL	ETN-9
REACTOR PLANT SYSTEMS	ETN-9
TECHNICAL ADMINISTRATION	ETN-9
<b>SUBMARINE REACTOR CONTROLS SUPERVISOR</b>	ETN-10
INSTRUMENTATION AND CONTROLS MAINTENANCE	ETN-10
REACTOR PLANT SYSTEMS	ETN-10
TECHNICAL ADMINISTRATION	ETN-10
<b>SURFACE REACTOR CONTROLS SUPERVISOR</b>	ETN-11
INSTRUMENTATION AND CONTROLS MAINTENANCE	ETN-11
REACTOR PLANT SYSTEMS	ETN-11
<b>SUBMARINE REACTOR CONTROLS MANAGER</b>	ETN-12
INSTRUMENTATION AND CONTROLS MAINTENANCE	ETN-12
TECHNICAL ADMINISTRATION	ETN-12
<b>SURFACE REACTOR CONTROLS MANAGER</b>	ETN-13
INSTRUMENTATION AND CONTROLS MAINTENANCE	ETN-13
RADIOLOGICAL CONTROL	ETN-13
REACTOR PLANT SYSTEMS	ETN-13
TECHNICAL ADMINISTRATION	ETN-13

NAVY ENLISTED OCCUPATIONAL STANDARD  
FOR  
ELECTRONICS TECHNICIAN, NUCLEAR POWER (ETN)



SCOPE OF RATING

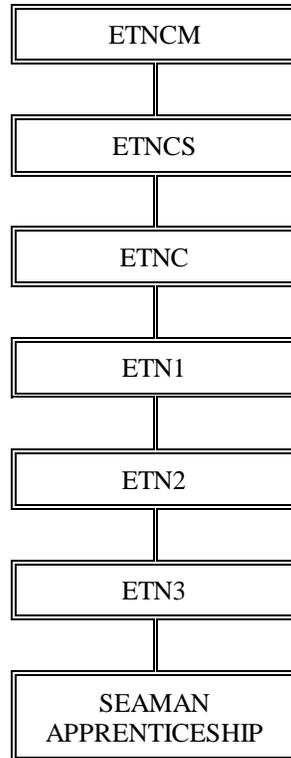
Electronics Technicians, Nuclear Power (ETN) operate and maintain Naval Nuclear propulsion plants and associated equipment; supervise and administer Naval Nuclear propulsion plant operations; thoroughly understand reactor, electrical, and mechanical theory involved in the operation of the nuclear reactor, steam plant, propulsion plant, and auxiliary equipment; possess a detailed knowledge of reactor and steam plant chemistry and radiological controls; operate and perform organizational and intermediate maintenance on electronic equipment used for reactor control, instrumentation, measurement, alarm warning, power distribution, protection and airborne particulate radiation detection; operate General Purpose Test Equipment (GPTE) and auxiliary equipment; test, calibrate, maintain, and repair electronic and hydraulic-electric systems that support reactor plant operation on both surface and sub-surface ships.

---

This Occupational Standard is to be incorporated in Volume I, Part B, of the Manual of Navy Enlisted Manpower and Personnel Classifications and Occupational Standards (NAVPERS 18068F) as Chapter 32.

## GENERAL INFORMATION

### CAREER PATTERN



Normal path of advancement to Chief Warrant Officer and Limited Duty Officer categories can be found in OPNAVINST 1420.1.

For rating entry requirements, refer to MILPERSMAN 1306-618.

#### **SAFETY**

**The observance of Operational Risk Management (ORM) and proper safety precautions in all areas is an integral part of each billet and the responsibility of every Sailor; therefore, it is a universal requirement for all ratings.**

**Job Title****Submarine Reactor Controls Operator****Job Code****003779****Job Family**  
Production**NOC**  
TBD**Short Title (30 Characters)**  
SUB REACTOR CONTROLS OP**Short Title (14 Characters)**  
SS REAC CNT OP**Pay Plan**  
Enlisted**Career Field**  
ETN**Other Relationships and Rules**  
NECs 3353, 3359**Job Description**

Submarine Reactor Controls Operators perform operations and basic preventive maintenance of electronic equipment used for reactor control, rod control, protection and alarm system, primary plant instrumentation, nuclear instrumentation, primary plant control, steam generator water level control, and other electrical and electronic support equipment; possess a thorough understanding of reactor, electrical, and mechanical theory involved in the operation of nuclear reactors, steam plants, and auxiliary equipment; possess detailed knowledge of chemistry and radiological controls associated with the nuclear reactor; supervise the shutdown of the reactor plant; perform critical work functions required to repair and maintain equipment and move naval tactical forces; and work under the supervision of a mentor while learning their trade or skill.

**DoD Relationship****O\*NET Relationship**

<u>Group Title</u>	<u>DoD Code</u>	<u>Occupation Title</u>	<u>SOC Code</u>	<u>Job Family</u>
Nuclear Power	166100	Nuclear Power Reactor Operators	51-8011.00	Production

**Skills**

Operation Monitoring  
 Operation and Control  
 Reading Comprehension  
 Equipment Maintenance  
 Systems Evaluation  
 Complex Problem Solving  
 Troubleshooting  
 Quality Control Analysis  
 Systems Analysis  
 Writing

**Abilities**

Problem Sensitivity  
 Written Comprehension  
 Deductive Reasoning  
 Arm-Hand Steadiness  
 Manual Dexterity  
 Inductive Reasoning  
 Control Precision  
 Selective Attention  
 Finger Dexterity  
 Information Ordering

**INSTRUMENTATION AND CONTROLS MAINTENANCE**

<u>Paygrade</u>	<u>Task Type</u>	<u>Task Statements</u>
E5	NON-CORE	Calibrate electrical meters
E5	NON-CORE	Calibrate mechanical gauges
E5	CORE	Conduct control rod testing
E5	CORE	Control maintenance on systems affecting remote operability
E5	CORE	Perform calorimetric calibrations
E4	CORE	Perform Feedwater Regulating Valve (FRV) preventative maintenance
E4	CORE	Perform hydraulic mechanical indicator preventative maintenance
E5	CORE	Perform preventative maintenance on Reactor Plant Instrumentation and Control Equipment (e.g. air particulate detectors, nuclear instrumentation, primary plant instrumentation, etc.)
E5	CORE	Perform static variable frequency converter preventative maintenance
E5	CORE	Repair Air Particulate Detectors (APD)
E5	CORE	Start up nuclear instrumentation systems
E5	CORE	Start up primary plant instrumentation systems
E6	CORE	Troubleshoot Air Particulate Detectors (APD)
E6	CORE	Troubleshoot hydraulic mechanical indicators
E5	CORE	Troubleshoot primary plant detectors

### INSTRUMENTATION AND CONTROLS MAINTENANCE (CONT'D)

E5	CORE	Troubleshoot reactor instrumentation and control equipment (e.g. primary instrumentation, nuclear instrumentation, rod control, etc.)
E5	CORE	Troubleshoot Steam Generator Water Level Control (SGWLC) systems

### RADIOLOGICAL CONTROL

<u>Paygrade</u>	<u>Task Type</u>	<u>Task Statements</u>
E4	CORE	Grant access to Radiological Controlled Areas (RCA)
E4	CORE	Maintain Radiological Controlled Area (RCA) records
E4	CORE	Survey primary valve radiological operations
E4	CORE	Survey Radiological Controlled Areas (RCA)

### REACTOR PLANT SYSTEMS

<u>Paygrade</u>	<u>Task Type</u>	<u>Task Statements</u>
E4	CORE	Align reactor air systems
E4	CORE	Align reactor plant fresh water systems
E4	CORE	Analyze Air Particulate Detector (APD) indicators for trends
E4	CORE	Analyze nuclear instrumentation indicators
E4	CORE	Analyze primary plant control system parameters
E4	CORE	Analyze primary plant instrumentation indicators
E4	CORE	Analyze reactor plant trends
E4	CORE	Analyze rod control parameters
E4	CORE	Analyze shutdown electric plant trends
E4	CORE	Analyze shutdown reactor plant trends
E4	CORE	Collect samples from steam generators
E5	CORE	Conduct control rod transfer operations
E4	CORE	Conduct steam generator blowdowns
E5	CORE	Inspect discharge boundary valve positions
E4	CORE	Line up reactor plant valves
E4	CORE	Maintain reactor plant system parameters using support systems (e.g. coolant charging, discharge, coolant purification, etc.)
E5	NON-CORE	Perform infrequent nuclear instrumentation operations
E5	NON-CORE	Perform infrequent primary plant instrumentation system operations
E5	CORE	Perform maintenance on primary plant detectors
E5	NON-CORE	Remove primary plant detectors from service
E4	CORE	Shift electric plant lineups from normal and alternate control stations (e.g. Electric Plant Control Panel (EPCP), Emergency Switchboard Local Control Station (ESLCS), etc.)
E4	CORE	Shut down main steam systems
E5	CORE	Shut down reactor plant
E4	CORE	Start up main steam systems
E5	CORE	Start up reactor plant

**REACTOR PLANT SYSTEMS (CONT'D)**

E4	CORE	Supply propulsion using Emergency Propulsion Motor (EPM)
E4	CORE	Supply propulsion using Secondary Propulsion Motor (SPM)
E5	CORE	Verify conditions established for prevention of inadvertent discharges

**TECHNICAL ADMINISTRATION**

<b><u>Paygrade</u></b>	<b><u>Task Type</u></b>	<b><u>Task Statements</u></b>
E5	CORE	Complete remote operability of key reactor plant valves checklists
E5	CORE	Tag out reactor plant components (e.g. instrumentation and control, mechanical, and electrical system, etc.)

**Job Title****Surface Reactor Controls Operator****Job Code****003780****Job Family**

Production

**NOC**

TBD

**Short Title (30 Characters)**

SUR REACTOR CONTROLS OP

**Short Title (14 Characters)**

SW REAC CNT OP

**Pay Plan**

Enlisted

**Career Field**

ETN

**Other Relationships and Rules**

NECs 3383, 3389

**Job Description**

Surface Reactor Controls Operators perform operations and basic preventive maintenance of electronic equipment used for reactor control, rod control, protection and alarm system, primary plant instrumentation, nuclear instrumentation, primary plant control, steam generator water level control, and other electrical and electronic support equipment; possess a thorough understanding of reactor, electrical, and mechanical theory involved in the operation of nuclear reactors, steam plants, and auxiliary equipment; possess detailed knowledge of chemistry and radiological controls associated with the nuclear reactor; supervise the shutdown of the reactor plant; perform critical work functions required to repair and maintain equipment and move naval tactical forces; and work under the supervision of a mentor while learning their trade or skill.

**DoD Relationship****O\*NET Relationship****Group Title**

Nuclear Power

**DoD Code**

166100

**Occupation Title**

Nuclear Power Reactor Operators

**SOC Code**

51-8011.00

**Job Family**

Production

**Skills***Equipment Maintenance**Reading Comprehension**Operation Monitoring**Operation and Control**Systems Evaluation**Complex Problem Solving**Troubleshooting**Quality Control Analysis**Systems Analysis**Writing***Abilities***Problem Sensitivity**Written Comprehension**Deductive Reasoning**Inductive Reasoning**Control Precision**Finger Dexterity**Information Ordering**Memorization**Oral Expression**Selective Attention***INSTRUMENTATION AND CONTROLS MAINTENANCE****Paygrade****Task Type****Task Statements**

E5

NON-CORE

Calibrate electrical meters

E5

NON-CORE

Calibrate mechanical gauges

E5

CORE

Conduct control rod testing

E5

CORE

Control maintenance on systems affecting remote operability

E5

CORE

Maintain continuous injection systems

E5

NON-CORE

Maintain Propulsion Plant Local Area Network (PPLAN) network settings

E4

NON-CORE

Maintain wire-free communication systems

E5

CORE

Perform automatic reactor fill initiation system preventative maintenance

E5

CORE

Perform calorimetric calibrations

E4

CORE

Perform Feedwater Regulating Valve (FRV) preventative maintenance

E4

CORE

Perform hydraulic mechanical indicator preventative maintenance

E5

CORE

Perform preventative maintenance on calorimetric calibration instrument systems

E5

CORE

Perform preventative maintenance on Reactor Plant Instrumentation and Control Equipment (e.g. air particulate detectors, nuclear instrumentation, primary plant instrumentation, etc.)

E4

CORE

Perform pump noise monitor preventative maintenance

E5

CORE

Repair Air Particulate Detectors (APD)

ETN-8

### INSTRUMENTATION AND CONTROLS MAINTENANCE (CONT'D)

E5	CORE	Start up nuclear instrumentation systems
E5	CORE	Start up primary plant instrumentation systems
E6	CORE	Troubleshoot Air Particulate Detectors (APD)
E6	CORE	Troubleshoot hydraulic mechanical indicators
E5	CORE	Troubleshoot primary plant detectors
E5	CORE	Troubleshoot pump noise monitor systems
E5	CORE	Troubleshoot reactor instrumentation and control equipment (e.g. primary instrumentation, nuclear instrumentation, rod control, etc.)
E5	CORE	Troubleshoot Steam Generator Water Level Control (SGWLC) systems

### RADIOLOGICAL CONTROL

<u>Paygrade</u>	<u>Task Type</u>	<u>Task Statements</u>
E4	CORE	Grant access to Radiological Controlled Areas (RCA)
E4	CORE	Maintain Radiological Controlled Area (RCA) records
E4	CORE	Survey Radiological Controlled Areas (RCA)

### REACTOR PLANT SYSTEMS

<u>Paygrade</u>	<u>Task Type</u>	<u>Task Statements</u>
E4	CORE	Analyze Air Particulate Detector (APD) indicators for trends
E4	CORE	Analyze nuclear instrumentation indicators
E4	CORE	Analyze primary plant control system parameters
E4	CORE	Analyze primary plant instrumentation indicators
E4	CORE	Analyze reactor plant trends
E4	CORE	Analyze rod control parameters
E4	CORE	Analyze shutdown reactor plant trends
E5	CORE	Conduct control rod transfer operations
E5	NON-CORE	Perform infrequent nuclear instrumentation operations
E5	NON-CORE	Perform infrequent primary plant instrumentation system operations
E5	CORE	Perform maintenance on primary plant detectors
E5	NON-CORE	Remove primary plant detectors from service
E5	CORE	Shut down reactor plant
E5	CORE	Start up reactor plant

### TECHNICAL ADMINISTRATION

<u>Paygrade</u>	<u>Task Type</u>	<u>Task Statements</u>
E5	CORE	Tag out reactor plant components (e.g. instrumentation and control, mechanical, and electrical system, etc.)

**Job Title****Submarine Reactor Controls Supervisor****Job Code****003787****Job Family**  
Production**NOC**  
TBD**Short Title (30 Characters)**  
SUB REACTOR CONTROLS SUP**Short Title (14 Characters)**  
SS REAC CNTSUP**Pay Plan**  
Enlisted**Career Field**  
ETN**Other Relationships and Rules**  
NEC 3363**Job Description**

Submarine Reactor Controls Supervisors perform advanced reactor controls operations and apply advanced level maintenance practices to reactor monitoring and control equipment; supervise operations, maintenance, and training for personnel assigned to the Reactor Controls Division; review correspondence; and perform audits of Reactor Controls Division programs; perform critical work functions required to move naval tactical forces; repair and maintain equipment; train forces and personnel; perform consequence management; work with little supervision; and serve as mentors to operators.

**DoD Relationship**

<i>Group Title</i>	<i>DoD Code</i>
Nuclear Power	166100

**O\*NET Relationship**

<i>Occupation Title</i>	<i>SOC Code</i>	<i>Job Family</i>
First-line Supervisors/Managers of Production and Operating Workers	51-1011.00	Production

**Skills**

*Management of Material Resources*  
*Repairing*  
*Complex Problem Solving*  
*Monitoring*  
*Learning Strategies*  
*Quality Control Analysis*  
*Reading Comprehension*  
*Speaking*

**Abilities**

*Written Comprehension*  
*Selective Attention*  
*Inductive Reasoning*  
*Oral Expression*  
*Written Expression*

**INSTRUMENTATION AND CONTROLS MAINTENANCE**

<b><u>Paygrade</u></b>	<b><u>Task Type</u></b>	<b><u>Task Statements</u></b>
E5	CORE	Repair hydraulic mechanical indicators
E5	CORE	Repair reactor instrumentation and control equipment (e.g. primary instrumentation, nuclear instrumentation, rod control, etc.)
E5	CORE	Repair Steam Generator Water Level Control (SGWLC) systems
E5	CORE	Supervise division maintenance operations (e.g. electrical, mechanical, reactor control, etc.)

**REACTOR PLANT SYSTEMS**

<b><u>Paygrade</u></b>	<b><u>Task Type</u></b>	<b><u>Task Statements</u></b>
E7	NON-CORE	Supervise infrequent reactor plant operations

**TECHNICAL ADMINISTRATION**

<b><u>Paygrade</u></b>	<b><u>Task Type</u></b>	<b><u>Task Statements</u></b>
E6	NON-CORE	Conduct training on remote operability
E7	CORE	Manage Reactor Control division audit and surveillance programs

**Job Title****Surface Reactor Controls Supervisor****Job Code****003788****Job Family**

Production

**NOC**

TBD

**Short Title (30 Characters)**

SUR REACTOR CONTROLS SUP

**Short Title (14 Characters)**

SW REAC CNTSUP

**Pay Plan**

Enlisted

**Career Field**

ETN

**Other Relationships and Rules**

NEC 3393

**Job Description**

Surface Reactor Controls Supervisors perform advanced reactor controls operations and apply advanced level maintenance practices to reactor monitoring and control equipment; supervise operations, maintenance, and training for personnel assigned to the Reactor Controls Division; review correspondence and perform audits of Reactor Controls Division programs; perform the critical work functions required to move naval tactical forces; repair and maintain equipment; train forces and personnel; perform consequence management; work with little supervision; and serve as mentors to operators.

**DoD Relationship****Group Title**

Nuclear Power

**DoD Code**

166100

**O\*NET Relationship****Occupation Title**First-line Supervisors/Managers of  
Production and Operating Workers**SOC Code**

51-1011.00

**Job Family**

Production

**Skills***Management of Material Resources**Repairing**Complex Problem Solving**Critical Thinking**Monitoring**Operation Monitoring**Troubleshooting***Abilities***Selective Attention**Written Comprehension**Deductive Reasoning**Inductive Reasoning**Problem Sensitivity***INSTRUMENTATION AND CONTROLS MAINTENANCE****Paygrade****Task Type****Task Statements**

E5

CORE

Repair automatic reactor fill initiation systems

E5

CORE

Repair calorimetric calibration instruments

E5

CORE

Repair continuous chemical injection systems

E5

CORE

Repair hydraulic mechanical indicators

E5

CORE

Repair reactor instrumentation and control equipment (e.g. primary instrumentation, nuclear instrumentation, rod control, etc.)

E5

CORE

Repair Steam Generator Water Level Control (SGWLC) systems

E6

CORE

Supervise automatic reactor fill initiation system maintenance

E6

CORE

Supervise calorimetric calibration instrument maintenance operations

E5

CORE

Supervise division maintenance operations (e.g. electrical, mechanical, reactor control, etc.)

E6

CORE

Troubleshoot automatic reactor fill initiation systems

E6

CORE

Troubleshoot calorimetric calibration instruments

**REACTOR PLANT SYSTEMS****Paygrade****Task Type****Task Statements**

E7

NON-CORE

Supervise infrequent reactor plant operations

**Job Title**

**Submarine Reactor Controls Manager**

**Job Code**

**003795**

**Job Family**

Production

**NOC**

TBD

**Short Title (30 Characters)**

SUB REACTOR CONTROLS MGR

**Short Title (14 Characters)**

SS REAC CNTMGR

**Pay Plan**

Enlisted

**Career Field**

ETN

**Other Relationships and Rules**

NECs 3359, 3363

**Job Description**

Submarine Reactor Controls Managers manage operations, maintenance, and training for personnel assigned to Reactor Controls Division and/or Engineering Department; review divisional and/or departmental correspondence; perform audits of divisional and/or departmental programs and training; perform critical work functions required to train forces and personnel; repair and maintain equipment; move naval tactical forces; and perform consequence management.

**DoD Relationship**

**Group Title**

Nuclear Power

**DoD Code**

166100

**O\*NET Relationship**

**Occupation Title**

Nuclear Power Reactor Operators

**SOC Code**

51-8011.00

**Job Family**

Production

**Skills**

*Quality Control Analysis*

*Reading Comprehension*

*Coordination*

*Installation*

*Management of Material Resources*

*Management of Personnel Resources*

*Monitoring*

**Abilities**

*Written Comprehension*

*Inductive Reasoning*

*Written Expression*

*Deductive Reasoning*

*Information Ordering*

*Selective Attention*

*Visualization*

**INSTRUMENTATION AND CONTROLS MAINTENANCE**

**Paygrade**

E7

**Task Type**

CORE

**Task Statements**

Manage equipment modifications (e.g. reactor, non-reactor, etc.)

E7

CORE

Supervise Reactor Control Division testing operations

**TECHNICAL ADMINISTRATION**

**Paygrade**

E6

**Task Type**

CORE

**Task Statements**

Audit division records (e.g. electrical, mechanical, etc.)

E7

CORE

Audit engineering and reactor department records

E5

CORE

Plan division maintenance schedules, equipment availability, and personnel assignments

E6

CORE

Supervise Quality Assurance (QA) testing

**Job Title****Surface Reactor Controls Manager****Job Code****003796****Job Family**  
Production**NOC**  
TBD**Short Title (30 Characters)**  
SUR REACTOR CONTROLS MGR**Short Title (14 Characters)**  
SW REAC CNTMGR**Pay Plan**  
Enlisted**Career Field**  
ETN**Other Relationships and Rules**  
NECs 3393, 3389**Job Description**

Surface Reactor Controls Managers manage operations, maintenance, and training for personnel assigned to Reactor Controls Division and/or Reactor Department; review divisional and/or departmental correspondence and perform audits of divisional and/or departmental programs and training; perform critical work functions of train forces and personnel; repair and maintain equipment; move naval tactical forces; and perform consequence management.

**DoD Relationship****Group Title**  
Nuclear Power**DoD Code**  
166100**O\*NET Relationship****Occupation Title**  
Nuclear Power Reactor Operators**SOC Code**  
51-8011.00**Job Family**  
Production**Skills**

Quality Control Analysis  
Reading Comprehension  
Monitoring  
Complex Problem Solving  
Coordination  
Equipment Maintenance  
Installation  
Learning Strategies  
Management of Material Resources  
Management of Personnel Resources

**Abilities**

Written Comprehension  
Written Expression  
Inductive Reasoning  
Selective Attention  
Deductive Reasoning  
Information Ordering  
Manual Dexterity  
Oral Expression  
Visualization

**INSTRUMENTATION AND CONTROLS MAINTENANCE**

<b>Paygrade</b>	<b>Task Type</b>	<b>Task Statements</b>
E7	CORE	Manage equipment modifications (e.g. reactor, non-reactor, etc.)
E7	CORE	Supervise Reactor Control Division testing operations

**RADIOLOGICAL CONTROL**

<b>Paygrade</b>	<b>Task Type</b>	<b>Task Statements</b>
E7	CORE	Verify discharge boundary valves prior to surface maintenance or evolutions

**REACTOR PLANT SYSTEMS**

<b>Paygrade</b>	<b>Task Type</b>	<b>Task Statements</b>
E7	CORE	Supervise surface ships casualty electrical distribution operations

**TECHNICAL ADMINISTRATION**

<b>Paygrade</b>	<b>Task Type</b>	<b>Task Statements</b>
E6	CORE	Audit division records (e.g. electrical, mechanical, etc.)
E7	CORE	Audit engineering and reactor department records
E6	NON-CORE	Conduct training on remote operability
E5	CORE	Plan division maintenance schedules, equipment availability, and personnel assignments
E6	CORE	Supervise Quality Assurance (QA) testing