TVA EMPLOYEE CONCERNS
SPECIAL PROGRAM

REPORT NUMBER: 312.11-SQN

REPORT TYPE: Sequoyah Nuclear Plant Element

REVISION NUMBER: 3

TITLE: Security Design and Hardware

REASON FOR REVISION:

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|---|---|
| Incorporate TAS/SRP Comments | Revision 1 |
| Incorporate SQN Response CATD 31211-SQN-01 | Revision 2 |
| Incorporate NRC Comments | Revision 3 |

PREPARATION

PREPARED BY:

R E Jones — SIGNATURE — 4/6/87 — DATE

REVIEWS

PEER:

L. McVay — SIGNATURE — 4/6/87 — DATE

TAS:

4/7/87 Randal R. Gibbs — SIGNATURE — 4/8/87 — DATE

CONCURRENCES

| | | | |
|---|---|---|---|
| | | CEG-H: W. R. Bryan | 4-6-87 |
| | | SRP: James R Russell | 4-8-87 |
| SIGNATURE | DATE | SIGNATURE* | DATE |

APPROVED BY:

W R Brown — ECSP MANAGER — 4/9/87 — DATE

N/A — MANAGER OF NUCLEAR POWER CONCURRENCE (FINAL REPORT ONLY) — DATE

*SRP Secretary's signature denotes SRP concurrences are in files.

1248T

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT

EMPLOYEE CONCERNS TASK GROUP

OPERATIONS

CEG

Subcategory: Security

Element: Security Design and Hardware

Report Number: 312.11 SQN Revision 3
XX-85-032-001
XX-85-099-001
IN-85-619-002
IN-85-955-001
IN-86-291-007
RII-86-A-0095

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| Evaluator: | R E Jones<br>R. E. Jones | 4/6/87<br>Date |
| Reviewed by: | [signature]<br>OPS CEG Member | 4/6/87<br>Date |
| Approved by: | W. R. Lagergren<br>W. R. Lagergren | 4-6-87<br>Date |

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I. Security Design and Hardware at SQN

The concerns addressed in this evaluation discuss the following conditions at Sequoyah (SQN): 1) the size of the protected area; 2) unreliable card readers; 3) loss of power to the Central Alarm Station (CAS); 4) slow access into the protected area in case of emergencies; and 5) inadequate key control.

II. Specific Evaluation Methodology

The evaluation was conducted on two SQN-specific concerns and four nonspecific concerns that were determined to be generic to SQN at the K-form level.

The following employee concerns, restated below, were evaluated:

A. XX-85-032-001 "Relocation of security portals about six months ago to the Turbine Building and doing away with the present operation of T-Cup Building which was serving as a security portal could leave areas open to sabotage. Per CI security should be around the entire plant, not leaving major parts open for sabotage."

B. XX-85-099-001 "Plant needs to be more secure. Protected area needs to be larger."

C. IN-85-619-002 "Card readers used in security systems are unreliable and often present false readouts of keycard numbers."

D. IN-85-955-001 "Power is frequently and consistently lost at the Central Alarm Station when operations is transferring power to support ongoing activities. This renders all systems (computers, vital area access doors, communications, etc.) inoperable. PSS management continuously requests advance notice of these events to no avail. Knoxville has been made aware of this problem and has responded by saying that the Central Alarm Station power is independent of other power sources and this event cannot occur - yet it does."

E. IN-86-291-007 "A flooding condition existed at the Intake Pumping Station. When the "alarm" was announced it took forty (40) minutes before the appropriate personnel could be cleared through security so the condition could be corrected. This delay was due to the Power Block Security concept and that the Intake Pumping Station is out of the Power Block area."

F. RII-86-A-0095 "The alleged stated that there are over 300 keys to the various room throughout the Browns Ferry Plant which contain safety-related equipment. These keys are poorly identified and poorly controlled. This poses a problem during a plant emergency when access to safety-related equipment is necessary. Also, some areas are not readily accessible in fires or other emergencies. This specific allegation applies to Browns Ferry only, however, it may also have generic implications for other TVA nuclear plants."

Concerns XX-85-032-001 and XX-85-099-002 are SQN-specific concerns and are considered issues that have been closed by Nuclear Safety Review Staff (NSRS) and line management evaluations as is shown on the employee concern data base. The evaluations for these two concerns were reviewed to verify the validity/nonvalidity of the concerns, the adequacy of any recommendations, line management response to recommendations and implementation of any associated corrective actions.

Concerns IN-85-619-002, IN-85-955-001, IN-86-291-007 and RII-86-A-0095 are generic concerns, as indicated in the employee concern data base, which were evaluated at SQN as open concerns to determine their validity. These concerns were evaluated along with regulatory commitments, associated procedures, TVA Quality Assurance audit reports, and NRC inspection results.

Five interviews with cognizant operations and plant security individuals were also conducted.

III. Findings

Power Block Security Concept (Concerns XX-85-032-001/XX-85-099-001)

The requirements for the protection of Nuclear Power plants are specified in 10 CFR 73.55. TVA meets these requirements through the implementation of the SQN plant Physical Security Plan, site implementation procedures and post orders.

NSRS Investigation Report I-85-616-SQN adequately evaluates concerns with the Power Block security concept at SQN. The objectives of the Power Block Concept (PBC) are to decrease the size of the physical protected area, reduce the total number of personnel requiring access to the protected area, and to focus more concentrated security efforts in a smaller protected area and vital areas.

The NSRS investigation found that the employee concerns with the security boundaries to be not valid. The "Power Block" concept of reducing the size of the protected area was thoroughly reviewed by TVA and approved by NRC. NRC inspections found that the security plan at SQN fulfilled the requirements of 10 CFR 73.

This evaluation concurs with the findings of the NSRS investigation.

Unreliable Card Readers (Concern IN-86-619-002)

Interviews with maintenance personnel determined that between 1 and 2 Work Requests (WRs) are written on card readers per day. From these WRs, maintenance personnel have to replace or repair approximately one card reader per week. Maintenance personnel informed the evaluator that they reviewed the RUSCO cardreader printouts for the evening shifts ofAugust 5 and August 6, 1986, and found that out of 11,113 cards read, only 24 items were flagged on the printout as wrong status level or improperly read cards. Further evaluation proved that 7 of these 24 items were from misread cards (for a failure rate of .063%), and one card reader was identified during this period as defective and was replaced. A review of the RUSCO tape and MR/WR computer listing by the evaluator, and interviews with security personnel validated the information supplied in the interview with maintenance personnel.

Instances where card readers fail to activate door mechanisms allowing entry into a given area are not always indications of an unreliable card reader system. A review of WRs on the card reader system from 1981 through 1986 indicates that although a WR may be written as a card reader problem, the card reader system was not at fault in the majority of cases. Malfunctions can involve a variety of factors such as door misalignment, intrusion alarm switch failures, defective key cards, or defective door latching mechanisms.

Based upon this evaluation of card reader maintenance records, card reader system unreliability cannot be validated. Instances of card reader failure (.063%) and corrective maintenance requirements on the card reader system are not at an unacceptable level.

Loss of Power to CAS (Concern IN-85-955-001)

The Sequoyah Security Plan requires that the Wells Fargo intrusion alarm system have an uninterruptable power source (UPS) capable of operation upon loss of offsite power. The Wells Fargo system fulfills this requirement with a battery system as was verified by an interview with security and engineering personnel. |R3

Backup power to the MAC 540 card reader computer is required per the NRC approved site security plan. Compensatory action is taken for loss of power to the MAC 540. Proper compensatory action was observed during switching of power sources to CAS. The Wells Fargo System went to battery power during the brief loss of power and security personnel were sent to verify that all vital doors were locked. |R3

A more detailed explanation of electronic security systems power supplies is given in reference 20 (RIMS S53 870403 904) which is a SAFEGUARDS document. |R3

Interviews with security and engineering personnel determined that the present security power sources have the possibility for short periods of power loss and voltage spikes to the MAC 540. A recurring problem with the MAC 540 is a loss of memory resulting from voltage spikes. On May 25, 1986 (as documented by LER 1-86024) a power transient caused a loss of memory to the MAC 540 computer. All access doors remained locked. A dusty disk drive and use of a bad disk (wrong format) compounded the problem by increasing the delay in reloading the computer memory. After the disk drive was cleaned and the correct disk was used, the MAC 540 memory was reloaded and the card readers became operational. |R3

During the loss of the MAC 540, individuals responsible to perform fire watch activities were not issued keys to fire doors and therefore did not complete their required rounds. LER 1-86024 was written to document the Tech Spec violation.

Because of the recurring problem with voltage spikes and to improve reliability of the MAC 540, engineering personnel are preparing a design change to switch the source of power for the MAC 540 to a diesel backed-up source in series with a UPS system. This UPS would filter out voltage spikes and during a loss of offsite power would provide power until the diesels picked up the load. This modification is not in response to this concern, is not yet scheduled, and is not a security regulatory requirement. However, the resultant enhancement will eliminate memory loss problems with the MAC 540 computer. |R3

Access to the Protected Area (Concern IN-86-291-007)

This employee concern was a Watts Bar specific concern considered to be generic to SQN at the K-form level. This concern involves emergency access to the Intake Pumping Station at SQN which is considered to be a protected/vital area requiring security access controls. A review of SQN site procedures revealed that access control in emergency situations is addressed. Physical Security Procedure PHYSI-2, "Access, Badging and Identification", covers the access of emergency personnel into the protected/vital areas. Twenty-five (25) visitor badges are reserved for emergency response personnel. In the event of an emergency situation, the Shift Engineer (SE) will notify Public Safety Services (PSS). A Public Safety Officer (PSO) is dispatched with the badges and required dosimetry to the scene of the emergency. The PSO rides with any vehicle inside the security barrier and gives each response individual a visitors ID badge and required dosimetry. No vehicle or personnel searches are required for protected or vital area entry under emergency conditions.

These procedures are adequate to prevent a similar problem from occurring at SQN.

Inadequate Key Control (RII-86-A-0095)

This is a Browns Ferry concern which is generic to SQN.

The requirements for the protection of Nuclear Power plants are specified in 10 CFR 73.55 and Regulatory Guide (Reg Guide) 5.12, "General Use of Locks in the Protection and Control of Facilities and Special Nuclear Materials." SQN meets these requirements through the implementation of the Division of Nuclear Power (NUC PR) procedure 0403.01, which requires each TVA Nuclear Power plant to maintain a key control program, and the SQN Security Plan.

Standard Practice SQA-2, "Key Control System", designates Public Safety Service (PSS) as responsible for the administration of a key and cylinder control system for the plant vital areas, backup locking system, and the high security padlock locking system. PSS SIL 40.0, "Security Locking System", administers the PSS key control system. A review of SIL 40.0 found that it adequately fulfilled the requirements of the SQN Security Plan and NRC commitments.

NRC inspection and QA audits conducted at SQN for 1984-1986 indicated only minor logging deficiencies in the PSS Key Control Program.

Operations Section Letter OSLA 65 administers the key control program for Operations Section and contains instructions for control and inventory of the keys in the Shift Engineers (SE) office.

A review of SQA-82 and OSLA 65 determined that they adequately address the subject of key control at Sequoyah. Keys are adequately identified and controlled. An interview with Operations personnel documented sufficient knowledge of the key control program. Operations logs were reviewed and indicated adequate implementation of the key control procedures. However, in at least one instance (LER 1-86024), keys were not issued when plant access doors were locked upon loss of memory to the MAC 540 card reader system. This resulted in a Tech Spec violation (LCO 3.7.12) for failure to complete fire tour inspections.

Conclusions

The issues expressed by employee concerns XX-85-032-001 and XX-85-099-001 were not validated and are not safety related. The "Power Block Concept" (PBC) security plan at SQN fulfills the requirements of 10 CFR 73.55, as documented in NRC investigations instituted July 8 through 11 and September 3 through 6, 1985. The NSRS investigation adequately addresses concerns XX-85-032-001 and XX-85-099-001, and found no objective evidence that the Sequoyah Security Program under the Power Block Concept provided a lesser degree of security than the previous security program.

Concern IN-85-619-002 was not validated at Sequoyah. A review of maintenance records and interviews with security and maintenance personnel determined the card readers were performing up to industry standards with the normal amount of card reader maintenance. This concern is not safety-related.

Concern IN-85-955-001 was validated at SQN but is not safety-related. Power to the MAC 540 can be lost as a result of transferring power or loss of offsite power which can result in MAC 540 computer memory loss. However, this does not violate the security plan. The Wells Fargo intrusion alarm system, which is separate from the MAC 540 card reader computer, has a back-up battery system as required by the SQN site security plan. But, upon loss of power or loss of memory to the MAC 540, compensatory actions are taken to allow access to vital areas. This situation can and has contributed to a Technical Specification violation as evidenced in LER 1-86034. |R3

Concern IN-86-291-007 was not validated. Procedures in effect at Sequoyah are adequate to handle the rapid access of emergency personnel into the required security area. The Essential Raw Cooling Water (ERCW) intake, which is out of the power block is presently manned by security 24 hours a day. This concern is not safety-related.

Concern RII-86-A-0095 was validated. The Sequoyah key control procedure fulfills the requirements of the security plan/NRC commitments and adequately controls the keys to safety-related equipment rooms. However, keys are not always provided to personnel requiring entry to locked rooms.

IV. Root Cause

Concern XX-85-032-001, XX-85-099-001, IN-85-619-002, and IN-86-291-007 were not validated and the root causes to concerns could not be determined.

Concern RII-86-A-0095 was validated and was caused by operations personnel failing to distribute room keys to personnel requiring entry into locked rooms.

Concern IN-85-955-001 was validated and was caused by inadequate design to prevent recurring computer memory loss problems caused by power transients.

V. Generic Applicability

1. Concern XX-85-032-001 and XX-85-099-001 are not generically applicable to BFN or BLN because the Power Block concept for access control to protected and vital areas is not used at BFN, and protected/vital area access control has not been instituted at BLN.

2. Concern IN-85-955-001 is generically applicable to other TVA nuclear plants. SQN has design deficiencies in power supplied to the MAC 540 which could apply to other sites.

3. IN-86-291-007 is generically applicable to other TVA sites because emergency access to plant protected areas is required for offsite support services such as fire fighting equipment and ambulances as well as for plant personnel.

4. RII-86-A-0095 is site specific for BFN and generic to BLN because lock and key controls may be implemented in a different manner at these plant sites than has been done at SQN.

5. Concern IN-85-619-002 was evaluated at SQN for generic applicability. As the concern was not valid at SQN there is no reason to expect it to be valid at BFN or BLN.

## VI. References


1. NSRS Investigation Report I-85-616-SQN, "Nuclear Plant Security"

2. Code of Federal Regulations, 10 CFR 73.55

3. SQN Security Plan (Safeguards Information)

4. PSS Physical Security Procedure PHYSI-2, "Access, Badging and Identification," Revision 24

5. Division of Nuclear Power Procedure 0403.01, "Key Card Key, Combination, and Core Controls Within the Division of Nuclear Power," dated August 11, 1983

6. Standard Practice SQA-2, "Key Control System," Revision 4

7. Operations Section Letter, OSLA 65, "Operations Key Control and Stopwatch and Radio Control System," dated February 18, 1965.

8. PSS SIL 40.0, "Security Locking System," (Safeguards Information), Revision 7

9. QAB Audit Report OSS-A-85-0006, January 7 - February 22, 1985 (Safeguards)

10. QAB Audit Report SQ-8400-05-Security, February 6 - 10, 1984 (Safeguards)

11. QA Surveillance Report 22b-84-P-003, August 16, 1984 (Safeguards)

12. NRC Region II inspection results, May 8, 1985 (Safeguards)

13. NRC Region II inspection results, July 22 - 26, 1984 (Safeguards)

14. NRC Region II quarterly inspection results, January 21 - 25, 1985 (Safeguards)

15. NRC Region II quarterly inspection results, July 8 - 11, 1985 (Safeguards)

16. NRC Region II quarterly inspection results, September 3 - 6, 1985 (Safeguards)

17. NRC Region II quarterly inspection results, November 18 - 22, 1985 (Safeguards)

18. NRC Region II inspection results, March 20 - 27, 1984 (Safeguards)

19. Licensee Event Report (LER) 1-86024, Revision 0, "Security Computer Malfunction Causes Missed Fire Watch," RIMS # 000143-3105

20. Memo Glen Turney to Robert S. Kaplan, "Sequoyah Nuclear Plant (SQN) - Electronic Security Systems Power Supplies," April 3, 1987, (RIMS S53 870403 904), (SAFEGUARDS) |R3

VII. Immediate or Long-Term Corrective Action

SQN response is as follows (CATD 31211-SQN-01 and CATD 31211-SQN-02):

1. Corrective actions were identified in LER 1-86024 which were designed to prevent loss of memory in the MAC-540 due to power transients. The following are the actions taken and completed under the respective Corporate Commitment Tracking System (CCTS) number.

   NCO-86-0235-001 Replace the hard sector disks used for backup to internal memory with soft sector: This ensures a more reliable back up to the memory if it is lost.

   NCO-86-0235-002 Implement a preventative maintenance (PM) procedure to periodically ensure that the MAC-540 disk drive system is clean and functioning properly: This ensures the availability of a reliable drive to reload memory in the event it is lost.

   NCO-86-0235-003 Implement a PM to periodically replace the backup battery to the MAC-540 memory system: This will ensure that for short-term power transients the battery will have a sufficient charge to maintain the memory.

   These actions were identified and implemented to first add assurance that the MAC-540 memory would not be lost during short-term power transients, and secondly, if the memory is lost, the disk drive and appropriate backup disk are available for quick reloading. No additional corrective actions are considered appropriate at this time.

2. The security access keys are available to Operations Staff during emergency situations to ensure plant safety. Providing keys to fire watches to perform normal hourly rounds is not a correct action within the scope of plant security.

   The security force is notified immediately of a loss of the MAC-540 and is aware of the fire watch requirement. They make every effort to supply a security officer to assist with rounds. This security interface, in conjunction with the corrective actions specified in LER 1-86-24, is considered appropriate. No additional corrective actions are to be taken on this issue.

REFERENCE - ECPS120J-ECPS121C
FREQUENCY - REQUEST
ONP - ISSS - RHM

TENNESSEE VALLEY AUTHORITY
OFFICE OF NUCLEAR POWER
EMPLOYEE CONCERN PROGRAM SYSTEM (ECPS)
LIST OF EMPLOYEE CONCERN INFORMATION



CATEGORY: OP PLANT OPER. SUPPORT

SUBCATEGORY: 31211 SECURITY DESIGN AND HARDWARE

| CONCERN NUMBER | CAT | SUB CAT | S H R D | PLT LOC | GENERIC APPL B F | B L | S Q | W B | QTC/NSRS INVESTIGATION REPORT | P S R | CONCERN DESCRIPTION | KEYWORD A / KEYWORD B / KEYWOKD C / KEYWORD D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IN -85-619-002 T50059 | OP | 31211 | N | WBN | N | N | Y | N | IN-85-619-002 REPORT | | CARD READERS USED IN SECURITY SYSTEM S ARE UNRELIABLE AND OFTEN PRESENT F ALSE READOUTS OF KEYCARD NUMBERS; PE RSONNEL IDENTITY. GENERIC CONCERN, NO FURTHER DETAILS, AVAILABLE. | SECURITY / POWER / GENERAL / SECURITY |
| IN -85-955-001 T50104 | OP | 31211 | N | WBN | Y | N | Y | Y | I-85-364-WBN REPORT | | POWER IS FREQUENTLY AND CONSISTENTLY LOST AT THE CENTRAL ALARM STATION W HEN OPERATIONS IS TRANFERRING POWER TO SUPPORT ON-GOING ACTIVITIES. THI S RENDERS ALL SYSTEMS (COMPUTERS, VI TAL AREA ACCESS DOORS, COMMUNICATION S, ETC.) INOPERABLE. PSS MANAGEMENT CONTINUOUSLY REQUESTS ADVANCE NOTIC E OF THESE EVENTS TO NO AVAIL. KNOX VILLE HAS BEEN MADE AWARE OF THIS PR OBLEM AND HAS RESPONDED BY SAYING TH AT THE CENTRAL ALARM STATION POWER I S INDEPENDENT OF OTHER POWERSOURCES AND THIS EVENT CANNOT OCCUR-YET | DESIGN PROCESS / NONCONFORMANCE / ENGINEERING / DC POWER |
| IN -86-291-007 T50147 | OP | 31211 | N | WBN | Y | N | Y | Y | I-85-622-WBN REPORT | | MAY/JUNE 1985. A FLOODING CONDITION EXISTED AT THE INTAKE PUMPING STATI ON. WHEN THE "ALARM" WAS ANNOUNCED IT TOOK FORTY (40) MINUTES BEFORE TH E APPROPRIATE PERSONNEL COULD BE CLE ARED THROUGH SECURITY SO THE CONDITI ON COULD BE CORRECTED. THIS DELAY I S DUE TO THE "POWER "BLOCK" SECURITY CONCEPT AND THAT THE INTAKE PUMPING STATION IS OUT OF THE POWER BLOCK A REA. (NAMES/DETAILS KNOWN TO QTC AN D WITHHELD TO MAINTAIN CONFIDENTIALI TY). NUCLEAR POWER CONCERN. CI HAS NO FURTHER INFORMATION. NO FOL | SAFETY CONDITION / SCHEDULE / SYSTEMS / SECURITY |

REFERENCE - ECPS120J-ECPS121C
FREQUENCY - REQUEST
ONP - ISCS - SWM

TENNESSEE VALLEY AUTHORITY
OFFICE OF NUCLEAR POWER
EMPLOYEE CONCERN PROGRAM SYSTEM (ECPS)
LIST OF EMPLOYEE CONCERN INFORMATION



CATEGORY: OP PLANT OPER. SUPPORT SUBCATEGORY: 31211 SECURITY DESIGN AND HARDWARE

| CONCERN NUMBER | CAT | SUB CAT | S H R D | PLT LOC | GENERIC APPL B F | B L | S Q | W B | QTC/NSRS INVESTIGATION REPORT | P S R | CONCERN DESCRIPTION | KEYWORD A / KEYWORD B / KEYWORD C / KEYWORD D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RII-86-A-0095 | OP | 31211 | N | BFN | Y | N | Y | Y | REPORT | | THE ALLEGER STATED THAT THERE ARE OV ER 300 KEYS TO THE VARIOUS ROOMS THR OUGHOUT THE BROWNS FERRY NUCLEAR PLA NT WHICH CONTAIN SAFETY-RELATED EQUI PMENT. THESE KEYS ARE POORLY IDENTI FIED AND POORLY CONTROLLED. THIS PO SES A PROBLEM DURING A PLANT EMERGEN CY WHEN ACCESS TO SAFETY-RELATED EQU IPMENT IS NECESSARY. ALSO, SOME ARE AS ARE NOT READILY ACCESSIBLE IN FIR ES OR OTHER EMERGENCIES. THIS SPECI FIC ALLEGATION APLIES TO BROWNS FERR Y ONLY, HOWEVER, IT MAY ALSO HAVE GE NERIC IMPLICATION FOR OTHER TVA | |
| XX -85-032-001 T50087 | OP | 31211 | N | SQN | N | N | N | N | XX-85-032-001 K-FORM | | SEQUOYAH- RELOCATION OF SECURITY POR TALS ABOUT SIX MONTHS AGO TO TURBINE BUILDING & DOING AWAY WITH THE PRES ENT OPERATION OF THE "T-CUP BUILDING " WHICH WAS SERVING AS A SECURITY PO RTAL COULD LEAVE AREAS OPEN TO SABOT AGE. PER CI SECURITY SHOULD BE ARO UND THE ENTIRE PLANT, NOT LEAVING MAJ OR PARTS OPEN FOR SABOTAGE. CI HAS NO FURTHER INFORMATION. | SECURITY / DESIGN PROCESS / GENERAL / GENERAL |
| XX -85-099-001 T50151 | OP | 31211 | N | SQN | N | N | N | Y | I-85-616-SQN K-FORM | | SEQUOYAH- THE PLANT NEEDS TO BE MORE SECURE. THE PROTECTED AREA NEEDS T O BE LARGER. NUCLEAR POWER DEPT CON CERN. CI HAS NO FURTHER INFORMATION . NO FOLLOW-UP REQUIRED. | SECURITY / DRUGS/THEFT/WEAP / OPERATIONS / SECURITY |

6 CONCERNS FOR CATEGORY OP SUBCATEGORY 31211