

ISHAM, LINCOLN & BEALE
COUNSELORS AT LAW

EDWARD S. ISHAM, 1872-1902
ROBERT T. LINCOLN, 1872-1889
WILLIAM G. BEALE, 1885-1923

ONE FIRST NATIONAL PLAZA
CHICAGO, ILLINOIS 60603
TELEPHONE 312 558-7500
TELEX: 2-5288

DOCKETED
1500

'82 APR 27 10:53
WASHINGTON OFFICE
1120 CONNECTICUT AVENUE, N.W.
SUITE 840
WASHINGTON, D.C. 20036
202 833-9730

April 26, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of)

COMMONWEALTH EDISON COMPANY)
(Quad Cities Station,)
Units 1 and 2)

Docket Nos. 50-254-SP
50-265-SP
(Spent Fuel Pool Modification)

Dear Administrative Judges:

Enclosed is the draft Order the Licensing Board requested during the conference call conducted on Friday, April 23, 1982. This draft order has been served on all parties in this proceeding by express mail. Also enclosed are drafts for the procedures which will govern the reracking operation at the Quad Cities Station. These procedures will be finalized and approved by Station personnel, and submitted to the NRC Senior Resident Inspector at the Quad Cities Station prior to commencement of the reracking operation.

Respectfully submitted,

Robert G. Fitzgibbons Jr.
Robert G. Fitzgibbons Jr.

RGF:emc
Enclosure
cc: Service List

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)	
)	Docket Nos. 50-254-SP
COMMONWEALTH EDISON COMPANY)	50-265-SP
(Quad Cities Station, Units)	(Spent Fuel Pool Modification)
1 and 2))	

CERTIFICATE OF SERVICE

I hereby certify that copies of Reracking Procedures QFP 1100-1 through QFP 1100-4 and draft Order have been served on the following by deposit in the United States mail, express mail, postage prepaid, this 26th day of April, 1982:

James L. Kelley
Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Dr. Peter A. Morris
Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Dr. Richard F. Foster
Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555
(also)
P.O. Box 4263
Sunriver, Oregon 97702

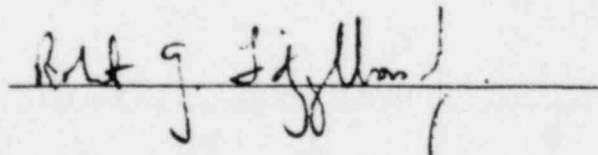
Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Atomic Safety and Licensing
Appeal Board Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Docketing and Service
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Richard Goddard
Office of Executive Legal
Director
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Doug Collins
Citizens For Safe Energy
622 4th Ave. So.
Clinton, IA 52732



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

Before Administrative Judges:
James L. Kelley, Chairman
Dr. Peter A. Morris
Dr. Richard F. Foster

In the Matter of)	
)	Docket Nos. 50-254-OLA
COMMONWEALTH EDISON COMPANY)	50-265-OLA
(Quad Cities Station,)	(Spent Fuel Pool Modification)
Units 1 and 2))	

ORDER

By our Order dated March 24, 1982, the parties in this proceeding were instructed to complete settlement discussions and report their results to the Atomic Safety and Licensing Board ("Licensing Board") no later than April 20, 1982. The date for completing settlement discussions was subsequently extended from April 20 to April 23, 1982. On April 23, 1982, the Licensing Board participated in a conference call with the representatives of Commonwealth Edison Company ("Applicant"), the Nuclear Regulatory Commission Staff ("NRC Staff"), and Quad Cities Alliance for Safe Energy and Survival and Citizens for Safe Energy ("Intervenors"). The results of the settlement discussions were reported to the Licensing Board at this time.

There are currently four contentions remaining at issue in this proceeding: Contention 5 (occupational exposure), Contention 6 (bowed fuel rods and fuel channels), Contention 8 (quality assurance), and Contention 9 (structural qualification of proposed racks for Safe Shutdown and Operating Basis Earthquakes). Intervenors verbally requested leave to withdraw Contention 9 prior to the April 23, 1982 conference call. In addition, the Licensing Board had deferred ruling on Contention 2 (alternatives) in our Order of October 27, 1981 until the NRC Staff's Environmental Impact Appraisal was available. The NRC Staff's Safety Evaluation Report ("SER") and Environmental Impact Appraisal ("EIA") were issued April 9, 1982. No comments on the SER and EIA were received from Intervenors.

During the course of the April 23, 1982 conference call, Intervenors requested leave to: (1) withdraw all contentions remaining at issue in this proceeding, including proposed Contention 2; and (2) withdraw their original requests for hearing. At the conclusion of the conference call, the Licensing Board asked the NRC Staff to supply the technical information it had provided the Intervenors during the settlement discussions which had led to Intervenors' requests for withdrawal. The Licensing Board also requested Applicant to supply the procedures drafted in response to Contention 8, which will be used during the reracking operation. This information has been received from the NRC Staff and Applicant, and has been reviewed by the Licensing Board.

On the basis of the April 23, 1981 telephone conference discussion, the NRC Staff's technical submittals, Applicant's draft reracking procedures, the SER and EIA, and the present posture of the case, the Licensing Board orders:

1. The contentions remaining at issue in this proceeding, Contentions 5, 6, 8 and 9, and proposed Contention 2, are withdrawn.

2. The Intervenors' Requests for Hearing are withdrawn.

3. This proceeding involving Commonwealth Edison Company's and Iowa-Illinois Gas and Electric Company's request to amend the operating licenses for the Quad Cities Station, Units 1 and 2, in order to increase these units' spent fuel pools' storage capacity, dated March 26, 1981, is hereby terminated.

4. In deciding to grant Intervenors' requests to withdraw and in making our decision to terminate this proceeding, the Licensing Board has relied on Applicant's commitment to submit the final approved procedures which will govern the reracking operation to the NRC Senior Resident Inspector at the Quad Cities Station prior to commencement of the reracking operation.

5. Wherefore, it is ORDERED, in accordance with the Atomic Energy Act, as amended and the regulations of the Nuclear Regulatory Commission, that the Director of Nuclear

Reactor Regulation is authorized to make appropriate findings in accordance with the Commission's regulations and to issue the appropriate license amendments authorizing the requested replacement of spent fuel storage racks at the Quad Cities Station.

6. It is further ORDERED, in accordance with 10 CFR 2.760, 2.762, 2.764, 2.785 and 2.786, that this Order shall be effective immediately^{1/} and shall constitute the final action of the Commission forty-five days after the issuance thereof, subject to any review pursuant to the above-cited Rules of Practice.

7. Exceptions to this Order may be filed within ten (10) days after service of this Order. A brief in support of the exceptions shall be filed within thirty (30) days thereafter [forty (40) days in the case of the Staff]. Within thirty (30) days of the filing and service of the brief of the Appellant [forty (40) days in the case of the Staff], any other party may file a brief in support of, or opposition to, the exception.

IT IS SO ORDERED.

THE ATOMIC SAFETY AND LICENSING BOARD

James L. Kelley,
Chief Administrative Judge

^{1/} This proceeding is not covered by the Commission's potential suspension of the immediate effectiveness rule (10 CFR 2.764). 44 Fed. Reg. 65049 (November 9, 1979).

Dr. Peter A. Morris, Administrative Judge

Dr. Richard F. Foster, Administrative Judge

Dated at Bethesda, Maryland

this _____ day of _____, 1982.

REMOVAL OF EXISTING
SPENT FUEL STORAGE RACKS

QFP 1100-1
Revision 2
April 1982

ID/3H

A. PURPOSE

The purpose of this procedure is to provide instructions for the removal of existing spent fuel racks from the Quad-Cities spent fuel pools.

B. REFERENCES

1. Dresden procedure for Removing Present Spent Fuel Racks, DFP 800-28.

C. PREREQUISITES

1. Radiation protection coverage is available.
2. Clean demineralized water and hose are available.

D. PRECAUTIONS

1. Ensure spent fuel racks to be removed are empty.
2. Due to possible high dose rates, the number of personnel present during rack removal should be restricted at the Fuel Handling Foreman's discretion. Access to the refuel floor is to be controlled by the Fuel Handling Foreman.
3. In no event shall the rack being removed pass over other racks containing fuel. The Fuel Handling Foreman will directly supervise the operation to ensure this requirement is met.

E. LIMITATIONS AND ACTIONS

1. If the dose rate becomes excessive as the spent fuel rack is removed, the operation should be stopped. Wash down racks to bring dose rates to an acceptable level.

F. PROCEDURE

1. Loosen the hold down nuts and move the swing bolts clear of the spent fuel rack to be removed.
2. Using appropriate cables and hooks, attach the rack to the nine ton auxiliary hook of the overhead crane.
3. Lift the rack slowly, being careful to assure that the rack does not become hung up on other racks or parts of the pool wall.

4. Lift the rack out of the water, rinsing with either clean demin or condensate transfer water if desired.

NOTE

Have Radiation Protection carefully MONITOR the dose rate as the rack emerges from the pool.

5. Move the rack to its designated location for storage and decontamination.

G. CHECKLISTS

1. None.

H. TECHNICAL SPECIFICATION REFERENCES

1. None.

GUIDELINES FOR THE REMOVAL OF LINER
ATTACHMENTS, REMOVAL OF EXISTING
COOLING WATER PIPES, AND INSTALLING
NEW COOLING WATER PIPES

QFP 1100-2
Revision 1
April 1982

ID/3J

A. PURPOSE

The purpose of this procedure is to provide guidelines for (1) removing all required swing bolt brackets which would interfere with the new spent fuel racks legs, (2) removing the six inch cooling water pipes, check valves, and pipe supporting brackets, and (3) installing the new cooling water pipe segments.

B. REFERENCES

1. NUS Drawing 5430-M-2003, Pool Liner and New Storage Racks Interference Arrangement Unit 1.
2. NUS Drawing 5430-M-2103, Pool Liner and New Storage Racks Interference Arrangement Unit 2.
3. QFP 1100-4, Guidelines for the Removal of Existing Racks and Installation of the New Racks.
4. NUS Drawing 5430-M-2204, Spent Fuel Storage Circulation Piping and Swing Bolt Modifications.
5. QFP 1100-5, Liner Repair Procedure.
6. Sargent and Lundy Specification, Quad-Cities Piping Design Table "H" 304 Stainless Steel, Class 150 dated December 7, 1973.
7. QFP 150-3, Operation of the Reactor Building 125/9 Ton Crane System.
8. P & ID's M-38 (M-80), Fuel Pool Cooling Piping.
9. QOP 1900-1, Fuel Pool Cooling System Startup.
10. QOP 1900-13, Fuel Pool Cooling and Cleaning System Shutdown.

C. PREREQUISITES

1. All equipment (instruments, tools, liner protective padding, and others) are available, tested, checked, and ready to operate.
2. Availability of necessary radiation monitoring and protective shield equipment for operators and divers.
3. Assure that communication system is operable between diver and personnel in pool area, and also between the pool area and control room.

4. Divers will be trained in the techniques, tools, etc., which will be used in cutting operations in order to prevent damage to the pool liner.
5. Review Tech Spec pool water level limits (33 feet) and obtain authorization for lowering pool water level before performing flame cutting operations of the six inch cooling water pipes.
6. Proper rigging will be used when working on the removal of six inch cooling water pipes and check valves.
7. Procedure QFP 1100-5 and necessary equipment for repairing liner shall be available.
8. Cleaning and vacuum equipment to remove residues from pool walls and floor should be available.
9. Determine if the cooling pipes are welded to the pool floor brackets.

D. PRECAUTIONS

1. Proper protective clothing and radiological protection equipment shall be used, as deemed necessary by the Radiation Protection Department.
2. Safety rules with regard to lifting and rigging should be followed.
3. Individuals should be aware of their responsibilities concerning radiation exposure.

E. LIMITATIONS AND ACTIONS

1. Access to the fuel pool area should be limited to individuals identified on the various job work permits.
2. Protective burn pads, such as transite, shall be used for all flame cutting operations to ensure that the liner is not damaged.
3. If grinding of the brackets is required, protective plates shall be used around brackets to ensure that grinding of pool liner does not occur.
4. Unless otherwise specified, removal of the swing bolt brackets and support bracket will be within 1/2" from the pool liner surface. All protrusions which interfere with the new rack legs will be guarded with 1/2" thick plates to ensure proper support of the rack.
5. Check that 6" pipe is not welded to brackets at the bottom of the pool before attempting to cut or remove pipes.
6. The amount of time the fuel pool is without cooling water flow must be minimized. Closely monitor pool water temperatures.
7. Only one of the pool cooling pipes shall be removed at a time. The other line must remain available should the need arise to startup the pool cooling system in an emergency.

8. During the cutting of attachments to the fuel pool liner, and for the following three shifts, check the tell-tale sight glasses on the fuel pool liner cavity drains to insure that there is not liner leak.

F. PROCEDURE

1. Cooling water pipe and check valve removal.
 - a. If the cooling pipes are welded to the pipe support brackets, the following three steps shall be performed.
 - (1) Fuel from racks F20 through F26 shall be relocated before working on the east pool side cooling pipes or fuel from racks A20 through A26 shall be relocated before working on the west pool side cooling pipes.

NOTE

Removal of cooling pipe and floor brackets may also be performed during new rack installation in order to minimize additional relocation of spent fuel assemblies.

- (2) Check that necessary prerequisites have been performed before diver enters pool for pipe to support bracket cutting operations.
 - (3) Perform necessary cutting operations and assure cooling pipe is free from floor brackets.
 - b. Determine necessary rigging attachment points which will be required to lift the cooling pipe segment from the pool and secure pipe.
 - c. Secure flow of water from spent fuel pool cooling water pumps and CLOSE VALVES 1901-17A and 17B to prevent back siphoning of water. Shutdown system per QOP 1900-13.
 - d. If performing the modification to either west side cooling pipe, carefully lower pool water approximately 3 feet by using the underwater vacuum, and pumping to the skimmer surge tank.
 - e. Attach platform and rigging under the cooling pipe cutting area when working on west side cooling pipes.
 - f. Secure tools and instruments to prevent them from falling into pool.
 - g. Flame cut pipe, at locations shown on NUS drawing 5430-M-2204.
 - h. On east side cooling pipes remove internal parts to check valves 1901-16.
 - i. Remove and decontaminate pipes and any unnecessary parts and equipment from pool.

2. Installation of new cooling water pipe (west side cooling pipes only).
 - a. Prepare stem for welding of the prefabricated new cooling pipe shown on NUS drawing 5430-M-2204.
 - b. Weld prefabricated new pipe to stem.
 - c. Perform appropriate nondestructive testing.
 - d. Remove platform, rigging, and equipment from pool.
 - e. Fill fuel pool to normal level, using normal makeup, and startup fuel pool cooling system per QOP 1900-1.
3. On all cooling water pipes, flame cut the support brackets assuring that the clearances identified on NUS drawing 5430-M-2204 are maintained after the cutting operation.
4. Removal of swing bolt brackets.
 - a. Removal of the swing bolt brackets will follow the sequence of existing rack removal and new rack installation. Refer to procedure QFP 1100-4 sequence. NUS drawings 5430-M-2003 (M-2103) should be used as a guide in identifying brackets to be flame cut.
 - b. Check that necessary prerequisites have been performed before diver enters pool for actual flame cutting operations.
 - c. Remove swing bolts and flame cut brackets, as shown on detail C of NUS drawing 5430-M-2204.

G. CHECKLISTS

1. None.

H. TECHNICAL SPECIFICATION REFERENCES

1. Section 3.10.C.

ON-SITE RECEIVING INSPECTION
PROCEDURE FOR HIGH DENSITY RACKS

QFP 1100-3
Revision 1
April 1982

ID/3K

A. PROCEDURE

The purpose of this procedure is to outline the method to provide on-site requirements and guidelines for inspecting, receiving, accepting, handling and storing the new high density fuel racks (HDFR).

B. REFERENCES

1. Joseph Oat Corp. Drawings and Procedures.
 - a. D-7070 Fuel Cell Details for HDFR.
 - b. D-7085 Module Assembly for HDFR.
 - c. JP-2443-2 Packaging and Shipping Procedure for HDFR.
 - d. D-7072 General Arrangement Spent Fuel Storage Racks.
 - e. 5430-M-2201, Upending Cradle.
 - f. E-7281, Lifting Yoke.
 - g. 5430-M-2202, Upending Base.
2. NUS Drawings.
 - a. 5430-M-2213, Rack Lifting Equipment and Rigging.
3. Quad-Cities Station Procedures.
 - a. QFP 1100-4, HDFR Installation Procedure.
 - b. QFP 150-3, Operation of the Reactor Building 125/9 ton Crane System.
 - c. QAP 600-6, Receiving, Handling, and Storage of Items and Routing of Documents.
 - d. QAP 900-2, Quality Receipt Inspection.
4. ANSI Specifications.
 - a. ANSI N45.2.1-1973, Cleaning of Fluid Systems and Associated Components During Construction Phase of Nuclear Power Plants.
 - b. ANSI N45.2.2-1978, Packaging, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants.

C. PREREQUISITES

1. Availability of the 125 ton hook on the reactor building crane.
2. Nonhalogen plastic wrap and tape materials if racks are unpacked and need rewapping for further storage.
3. If required, a suitable mobile crane for outdoor loading and unloading.

D. PRECAUTIONS

1. Handling and unpacking racks should be done with extreme care. Lifting racks from truck should be done using the lifting device shown on NUS drawing 5430-M-2213. All safety rules should be followed when operating the 125 ton crane.
2. Receiving inspection will be done jointly by QA, QC, and Stores personnel.

E. LIMITATIONS AND ACTIONS

1. None.

F. PROCEDURE

1. Quality Assurance, Stores, and Quality Control personnel will visually inspect packaged rack while on truck at the area for the following items. All findings should be recorded.
 - a. A shipping release tag must be attached to each rack. The shipping release tag should be used to assure that dimensional checks and all testing inspection and examination requirements were performed before the rack left the fabricator.
 - b. Verify that racks are identified by rack numbers given on Joseph Oat Corp. drawing D-7072.
 - c. Visually inspect protective covers and seals to assure they meet their intended function. Record any torn areas or environmental damage such as soiled areas, salt film or oil marks.
 - d. Assure that there are no tie down failures, shifting of loads, improper blocking or tie down during shipping.
2. If the rack appears damaged, notify the Station Nuclear Engineering Department and manufacturer for authorization to remove racks for inspection or return to manufacturer for repair.
3. If there is no visible damage, rack should be removed from truck for placement in temporary storage or preparation for installation into the spent fuel pool.

4. If racks are to be placed into temporary storage, they should be stored as packaged on the shipping skid.

NOTE

Racks should also be stored in a manner which will facilitate removal from the storage area when needed for installation. Check QFP 1100-4 for order of installation.

5. If racks are to be installed into the pool, the following steps should be followed by the Fuel Handling Group.
- a. Using the rigging equipment and 125 ton crane, rack and skid should be lifted to the refuel floor and placed in the upending cradle. Reference NUS drawings 5430-M-2201 and 5430-M-2202.
 - b. Strap rack while still on skid to the upending cradle.
 - c. Using the 125 ton hook, raise rack to vertical position.
 - d. Remove straps and unpackage rack for inspection using the following items. Discard skid and plastic wrapping before they become contaminated. The inspection will be conducted by qualified personnel before racks are installed in the spent fuel pool.
 - (1) A review of the documentation given by QFP 1100-S1 shall be performed to verify that all requirements were met before shipping. Approval for many of these documents may have occurred at the fabricator's facility before rack shipment.
 - (2) Random visual inspection to assure that important dimensions conform with drawings. As examples, overall external size, support leg plate thickness and proper size of thread lifting holes could be checked.
 - e. If there is no visible damage, randomly test 5% of cells with the 8.0' (half length) free path gage.

NOTE

All four corner cells and at least three additional cells on the rack side which were in contact with the shipping skid should be tested. If there is a question of potential damage, rack should be placed on the ground floor (595 foot level) for further inspection using the full length free path gauge.

6. After inspection, if the rack needs to be relocated prior to installation, the following guidelines should be used.
- a. Assemble lifting yoke and rods per NUS drawing 5430-M-2200.

- b. Attach slings to crane hook and position lifting yoke assembly over rack.
- c. Screw threaded ends of rods into support legs and assure a minimum thread engagement of 1.0 inch.
- d. Adjust Belleville washer spring packages and sling lengths per NUS drawing 5430-M-2200.
- e. Gradually load the rods until the Belleville washer spring assemblies deflect 3/8 inch.
- f. During lifting, care must initially be taken that lifting rods are equally loaded. Difference in deflection of the Belleville washer spring assemblies should be within 3/8 inch of each other. If this deflection is exceeded, readjust length of turnbuckles until the lifting yoke is level to within this limit.

NOTE

The above step is performed to initially level the lifting yoke. Additional adjustments are performed by adjusting the Belleville washer spring assembly nuts.

- g. Gradually increase loading on the crane and recheck that the Belleville washer spring assemblies deflect to within 3/8 inch of each other before lifting rack free of floor and assure that the rack is supported by the Belleville washers in a noncompressed condition.
- h. Relocate rack to desired location.
- i. Unthread lifting rods and disconnect the lifting yoke from the rack.

G. CHECKLISTS

- 1. QFP 1101-S1.

H. TECHNICAL SPECIFICATION REFERENCES

- 1. None.

ID/3L

LIST OF TECHNICAL DOCUMENTATION
Rack Serial Number _____

QFP 1100-S1
Revision 1
April 1982

DOCUMENT	RECEIVED	APPROVED
1. Index to Records Package.		
2. As-Built Drawings.		
3. Material Record Form.		
4. Certified material Test Reports.		
(A) Materials.		
(B) Weld Wire.		
5. Non-Destructive Examination Reports.		
(A) Liquid Penetrant.		
(B) Visual Examination.		
6. Weld Repair Records.		
7. Certification of Welder Personnel Qualifications.		
8. Certification of NDE Personnel Qualifications.		
9. Deviations.		
10. Non-Conformance Reports.		
11. Free Path Test Reports.		
12. Neutron Absorption Test Reports.		
13. Final Inspection Reports.		
14. Certified copies of Process Inspection Reports.		

GUIDELINES FOR THE REMOVAL OF
EXISTING RACKS AND
INSTALLATION OF THE NEW RACKS

QFP 1100-4
Revision 1
April 1982

ID/3M

A. PURPOSE

The purpose of this procedure is to provide guidelines for removing the existing racks and installing the new racks at the Unit 1 and 2 spent fuel storage pools, and to provide a baseline approach for performing all related work for the rack installation project.

B. REFERENCES

1. Joseph Oat Drawings and Procedures.

- a. D-7070 Fuel cell details for High Density Fuel Racks
- b. D-7085 Module assembly for High Density Fuel Racks
- c. D-7072 General arrangement for High Density Fuel Racks
- d. E-7281 Lifting Yoke
- e. 5430-M-2201 Upending Cradle
- f. 5430-M-2202 Upending Base

2. NUS Drawings.

- a. 5430-M-2001 Unit 1 Existing Spent Fuel Storage Racks
Fuel Pool Arrangement
- b. 5430-M-2002 Unit 1 Existing & New Spent Fuel Storage
Racks Overlay Arrangement
- c. 5430-M-2003 Pool Liner and New Storage Racks Interference
Arrangement Unit 1
- d. 5430-M-2004 Unit 1 Installation Arrangement
- e. 5430-M-2101 Unit 2 Existing Spent Fuel Storage Racks
Fuel Pool Arrangement
- f. 5430-M-2102 Unit 2 Existing and New Spent Fuel Storage
Racks Overlay Arrangement
- g. 5430-M-2103 Pool Liner and New Storage Racks Interference
Arrangement Unit 2
- h. 5430-M-2104 Unit 1 Installation Arrangement

- i. 5430-M-2204 Spent Fuel Storage Circulation Piping and Swing Bolt Modification
- j. 5430-M-2205 Rack Pad
- k. 5430-M-2206 Pad Locating Tool
- l. 5430-M-2207 Leg Shims
- m. 5430-M-2208 Shim Placing Tool
- n. 5430-M-2209 Shim Box
- o. 5430-M-2210 Rack Rod Holder
- p. 5430-M-2211 Measuring Gauge
- q. 5430-M-2212 Existing Spent Fuel Storage Rack Lifting Device
- r. 5430-M-2213 Rack Lifting Equipment and Rigging

3. Quad-Cities Station Procedures and Special Tests

- a. Special Test 1-57 Boreflex Off-Gassing Apparatus Installation and Test Procedure
- b. QFP 1100-2 Guidelines for Removal of Attachments and Installation of Cooling Water Pipe
- c. QFP 1100-3 On Site Receiving and Inspections Procedure for High Density Rack
- d. QFP 1100-6 Spent Fuel Pool Liner Repair Procedure
- e. QFP 150-3 Operation of the Reactor Building 125/9 Ton Crane System
- f. QFP 1100-7 Neutron Attenuation Test Procedure
- g. QFP 100-2 Transfer of Fuel - SNM Between or Within Spent Fuel Pools or Vaults

C. PREREQUISITES

- 1. Availability of 125/9 ton crane system.
- 2. Availability of necessary radiation monitoring and protective shield equipment for operators and divers.
- 3. Liner repair equipment, cutting tools, lifting devices, shims plates, and handling tools identified on the applicable reference drawings and available.

4. Cleaning and vacuum equipment to remove residues from pool floor and walls should be available.
5. Assure that communication systems are operable between diver and advisory personnel in pool area and also between the pool area and control room.
6. A radiation work permit (RWP) shall be obtained for working over and in the spent fuel pool.
7. Assure that all receiving and inspection requirements of QFP 1100-3 Section F and the free path gauge test also defined in Section F of the same procedure have been met or performed before preparing a new rack for installation.
8. Sequence of Installation defined in Section E. should be made known to individuals responsible for temporary storage of new racks in order to avoid time delays in obtaining the required rack for installation. New rack to be installed should be already located on the fuel pool operating floor level following the process defined in QFP 1100-3.
9. Assure that the stored spent fuel arrangement in Unit 1 agrees with that shown on Figure 1 prior to performing any removal or installation operations. Relocate stored fuel if necessary to achieve the Figure 1 arrangement.

D. PRECAUTIONS

1. Proper protective clothing and radiological detection equipment shall be used as deemed necessary by the Radiation Protection Department.
2. All site safety rules of the QFP 150-3 procedure with regard to lifting and rigging should be followed.
3. Individuals should be aware of the responsibilities concerning radiation exposure (ALARA Program).
4. Check to assure that all swing bolts are detached from an existing spent fuel storage rack before lifting rack with the 9 ton crane.
5. Assure that the low level pool water limits of Section H.1 are known and authorization is obtained prior to lowering pool water level for any flaming cutting operation defined in the QFP 1100-2 procedure if the cooling water pipe modifications are performed during rack installation.

E. LIMITATIONS AND ACTIONS

1. Access to the fuel pool area shall be limited.
2. If grinding of the floor brackets is required protective plates shall be used around brackets to ensure that grinding of the pool liner does not occur.

3. Protective burn pads, such as transite, shall be used for all flame cutting operations to ensure that the liner is not damaged.

F. PROCEDURE

1. The initial existing racks which will be removed from the Unit 1 pool are X29, Y29, Z29, Z31, D12 through D26, E10 through E26, and F10 through F22 as indexed on Figure 1. The sequence of new rack installation is Unit 1 followed by Unit 2 with the first nine racks as defined on the NUS 5430-M-2004 drawing and Figure 6.

1st	Rack F1
2nd	Rack E1
3rd	Rack G1
4th	Rack B1
5th	Rack B2
6th	Rack B3
7th	Rack C1
8th	Rack C2
9th	Rack C3

2. Removal of existing racks should be performed in accordance with the following process:
 - a. Using proper remote operating tools, back off swing bolt nuts sufficient to remove all swing bolts clear of the rack.
 - b. A second check should be made to assure that all bolts have been detached before attempting to remove each rack from the pool.
 - c. Assemble the lifting equipment shown on the NUS 5430-M-2212 drawing and attach the 9 ton crane hook to the lifting lug.
 - d. Lower the lifting equipment over the proper rack and attach the lifting hook using the proper remote equipment.
 - e. Remove the existing rack, hosing it as it is removed, and transport to a designated cleaning, decontamination or storage area.
 - f. Repeat the required steps in this section as necessary.

NOTE

A recommended removal sequence of existing racks is X29, Y29, Z29, Z31 followed by the racks in rows D, E, and F.

3. Assure that all modifications have been performed to the cooling water pipe at the northeast corner prior to installing the first new rack F1.

NOTE

The cooling pipe modification can be performed prior to the removal of existing racks or at this point in the installation process. The procedure for performing the cooling water pipe modification is defined in QFP 1100-2.

4. Establish a north south working line along the east edge of the pool and an east west work line along the north edge of the pool in order to establish measurements shown on NUS drawing 5430-M-2004 and 2104.
5. Assure that all swing bolts and brackets which would interfere with the rack support legs have been flame cut to within 1/2" of the liner surface. NUS drawings 5430-M-2003 and 2103 should be used as a guide in identifying brackets to be flame cut. The procedure for performing all removal operations is contained in QFP 1100-2.
6. After removal of all liner interferences locate the Rack Pads shown on NUS drawing 5430-M-2205 to the proper pool floor locations using the dimensions shown on the NUS drawings 5430-M-2002 and 2102 as guidelines for initial locations.

NOTE

The rack pads shown on NUS drawing 5430-M-2205 will require modification through flame cutting operations in order to properly fit around the interfering swing bolt brackets.

7. Assure that all prerequisites identified in QFP 1100-3 have been performed before preparing a new rack for installation into the spent fuel pool.
8. Prepare the F1 rack for lifting as follows:
 - a. Assemble lifting yoke and rods shown on JOC drawing E-7281.
 - b. Attach slings to crane hook and position lifting yoke assembly over rack.
 - c. Screw threaded ends of rods into support legs and assure a minimum thread engagement of 1.0 inch.
 - d. Adjust Belleville washer spring packages and sling lengths shown on JOC drawing E-7281.
 - e. Gradually load the rods until the Belleville washer spring assemblies deflect 3/8 inch.

- f. During lifting, care must initially be taken that lifting rods are equally loaded. Difference in deflection of the Belleville washer spring assemblies should be within 3/8 inch of each other. If this deflection is exceeded, readjust length of turnbuckles until the lifting yoke is level to within this limit.

NOTE

The above step is performed to initially level the lifting yoke. Additional adjustments are performed by adjusting the Belleville washer spring assembly nuts.

- g. Gradually increase loading of the crane and check that the Belleville washer spring assemblies deflect to within 3/8 inch of each other until rack is free of floor and supported by the Belleville washers in a noncompressed condition.
9. Bring rack into position and lower the rack to approximately a foot from the proper pool floor location defined on NUS drawing 5430-M-2004 or 2104.
10. Using the pad locating tool shown on drawing 5430-M-2204, make any necessary adjustments required to assure the rack legs will rest on the rack pads before the rack is lowered into position.

NOTE

A 1" minimum distance is required between the edges of the rack support leg plates and edges of the pad plates on all four sides.

11. Lower the rack into position and assure the location agrees with general arrangement drawing D-7072.
12. Check the plumbness of the rack to the requirements on drawing D-7085.

NOTE

Shimming may be required in order to account for unlevel conditions of the pool floor and to achieve the necessary plumbness requirements. Special equipment and shims defined on NUS 5430-M-2207, 2208, 2209, 2210, and 2211 drawings are provided to achieve the required plumbness.

- a. If an out-of-plumb or gap condition exceeding 1/16" exists between the rack pad and leg determine the size of shim required using the measuring gauge shown on NUS drawing 5430-M-2211.
- b. Obtain proper size shims and build-up the spacing as required to obtain plumbness and flush conditions between rack pad and leg.

- c. Using the pad locating pool (drawing 5430-M-2204) assure that the 1" minimum distance between the edges of the rack support leg plates and edges of the rack pad plates are still maintained along all four sides.

13. Repeat steps E5 through E12 for the installation of racks E1 and G1.

NOTE

The requirement for rack alignment and spacing identified on NUS drawings 5430-M-2004 and 2104 must be maintained between adjacent racks and the pool walls.

14. Perform the neutron attenuation test on racks F1, E1, and G1 in accordance with QFP 1100-7 or make sure the test already has been performed as documented in QFP 1100-S1.
15. Relocate 150 spent fuel assemblies from existing racks C26 through C16, D02 and D04 to new racks F1, E1, and G1 and assure that the final storage arrangement conforms to that shown on Figure 2.

NOTE

Assure that all prerequisites defined in the QFP 100-2 procedure have been met before relocating any spent fuel assemblies.

16. Repeat steps F.5 through F.12 for the installation of the B1 rack.
17. Relocate 52 additional spent fuel assemblies to the F1 rack from racks C16, C14, C12 and C10 in order to provide divers with additional water shielding for the installation of the B2 rack. The Unit 1 pool arrangement at this point should agree with the configuration shown on Figure 3.

NOTE

Assure alignment and spacing requirement of NUS drawing 5430-M-2004 and prerequisites of QFP 100-2 procedure are met during the step F.16 and F.17 operations.

18. Repeat steps F.5 through F.12 for the installation of the B2 rack.
19. Perform the neutron attenuation test on racks B1 and B2 in accordance with QFP 1100-7 if such testing was not performed previously as documented in QFP 1100-S1.
20. Relocate 205 spent fuel assemblies from existing racks C10 through C02 and B12 through B02 and 24 spent fuel assemblies in the G1 rack to the new rack storage location shown on Figure 4.
21. Repeat step F.2 for the removal of existing racks D02, D04, C08, C06, C04, C02, B04 and B02.

22. Relocate the control rod racks in locations D10, D08, and D06 to locations C06, C04, and C02, if needed for an upcoming refuel outage.
23. Repeat steps F.5 through F.12 for the installation of the B3 rack as shown in Figure 5.
24. Relocate 265 spent fuel assemblies from racks B26 through B12 and A14 through A04 and 24 spent fuel assemblies in racks B1 and B2 to racks E1 and G1.

NOTE

At this point in the installation operations, new racks F1, E1 and G1 will be full of spent fuel and the Unit 1 pool arrangement would be that shown on Figure 5.

The arrangement shown on Figure 5 also represents the minimum installation operations which should be completed before the September 1983 refueling outage.

25. Repeat steps F.5 through F.12 for the installation of the C1 and C2 racks.
26. Relocate the remaining 128 spent fuel assemblies from racks A26 through A14 to the B1 rack locations shown on Figure 6.
27. Repeat step F.2 for the removal of existing racks A26 through A04 and B26 through B04.
28. Relocate the control rod racks in locations C02, C04, and C06 to locations A04, A06, and A08. Install more control rod racks, if desired.
29. Relocate the 192 fuel assemblies in the G1 rack to the B1 and B2 rack locations as shown on Figure 7 in order to provide divers with additional shielding for the installation of the B4 rack.
30. Repeat steps F.5 through F.12 for the installation of the remaining new racks shown on Figures 7 and 8.
31. Perform the neutron attenuation test on racks B3, C1, C2, C3, C4 and K1 in accordance with QFP 1100-7 if such testing was not performed previously as documented in QFP 1100-S1.
32. The Unit 2 pool contains a total of 1140 spent fuel assemblies arranged as shown on Figure 9. The initial operation will be to relocate 642 fuel assemblies from racks of F section, E section, D section, Z section, Y section, X section, C section, and two fuel bundles from B section into Unit 1 racks G1, B2, B3 and C4.
33. Relocate 258 spent fuel assemblies from B02 through B26 into Unit 1 racks C1 and C2. The configuration in the Units 1 and 2 pools after this operation are shown on Figures 10 and 11.

34. Repeat step E.2 for the removal of racks in D, E, F, X, Y, Z, and C sections.
35. Assure that all modifications have been performed to the cooling water pipe prior to installing the racks near the cooling pipes.
36. Repeat steps E.5 through E.12 for the installation of racks J1, E2, E3, F2, C8, B4, B5, B6, K2, C5, C6, and C7.
37. Perform the neutron attenuation test on racks J1, E2, E3, F2, C8, B4, B5, B6, K2, C5, C6, and C7 in accordance with QFP 1100-7 or assure that it has been performed as documented in QFP 1100-S1.
38. Relocate the remaining 240 spent fuel assemblies in A section into racks J1 and E2.
39. Remove the racks from A and B sections and install racks H4, A7, A8, and D4. Install control rod racks as needed in section A.
40. The installation operations should be controlled by the requirements of CECO's Quality Assurance Program. Items which must be verified shall include but not be limited to the following:
 - a. Checklist requirements of QFP 1100-3.
 - b. Orientation and location of all racks in the two spent fuel pools.
 - c. Verification of gaps between racks and walls.
 - d. Verification of rack plumbness and alignment.



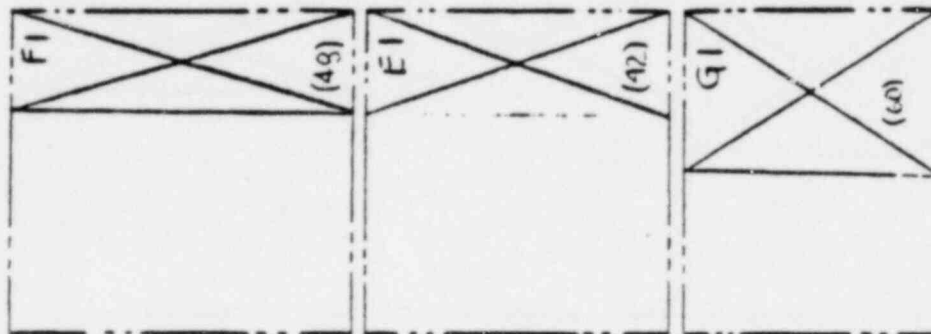
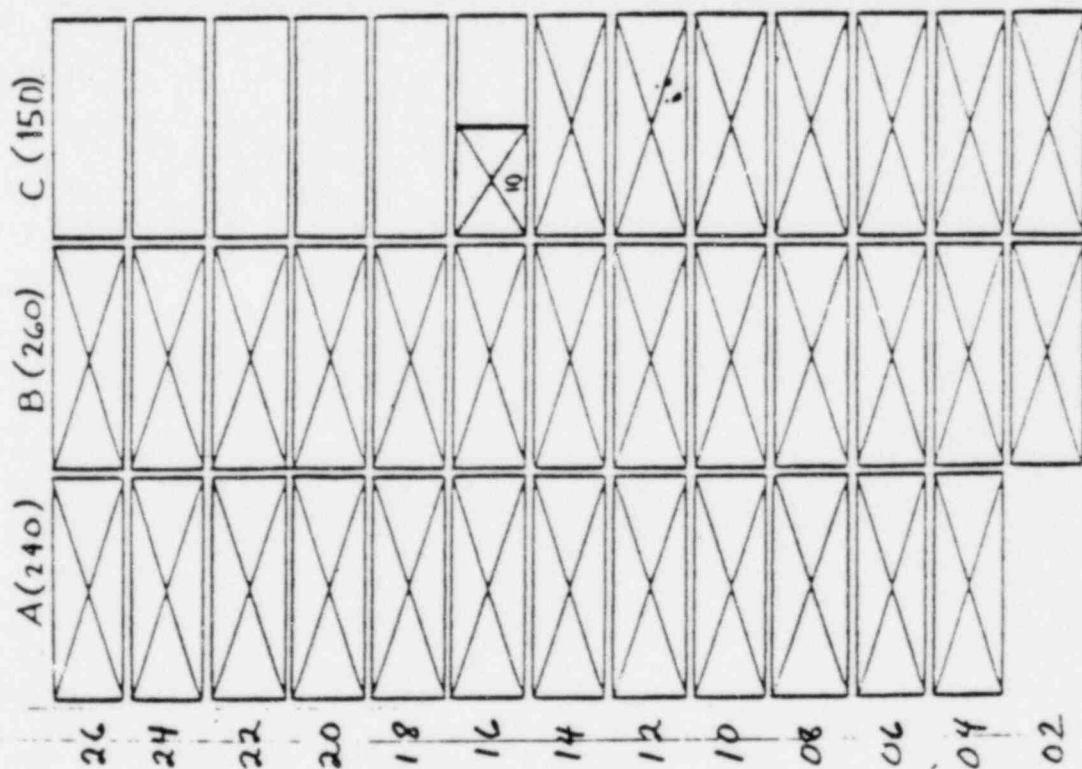
UNIT ONE

Z

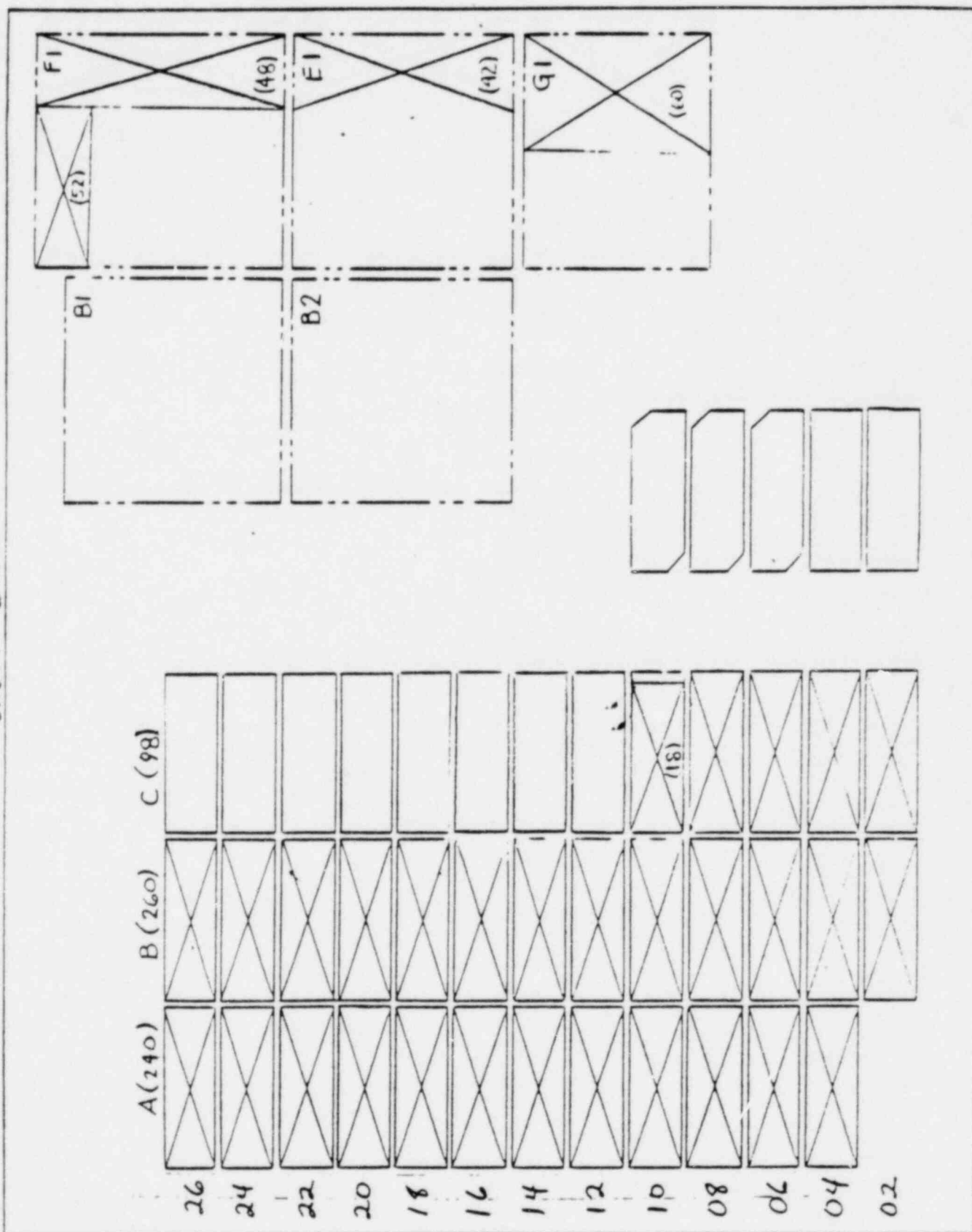
	X	Y		D	E	F
26						
24						
22						
20						
18						
16						
14						
12						
10						
08						
06						
04						
02						

A(240) B(260) C(260)

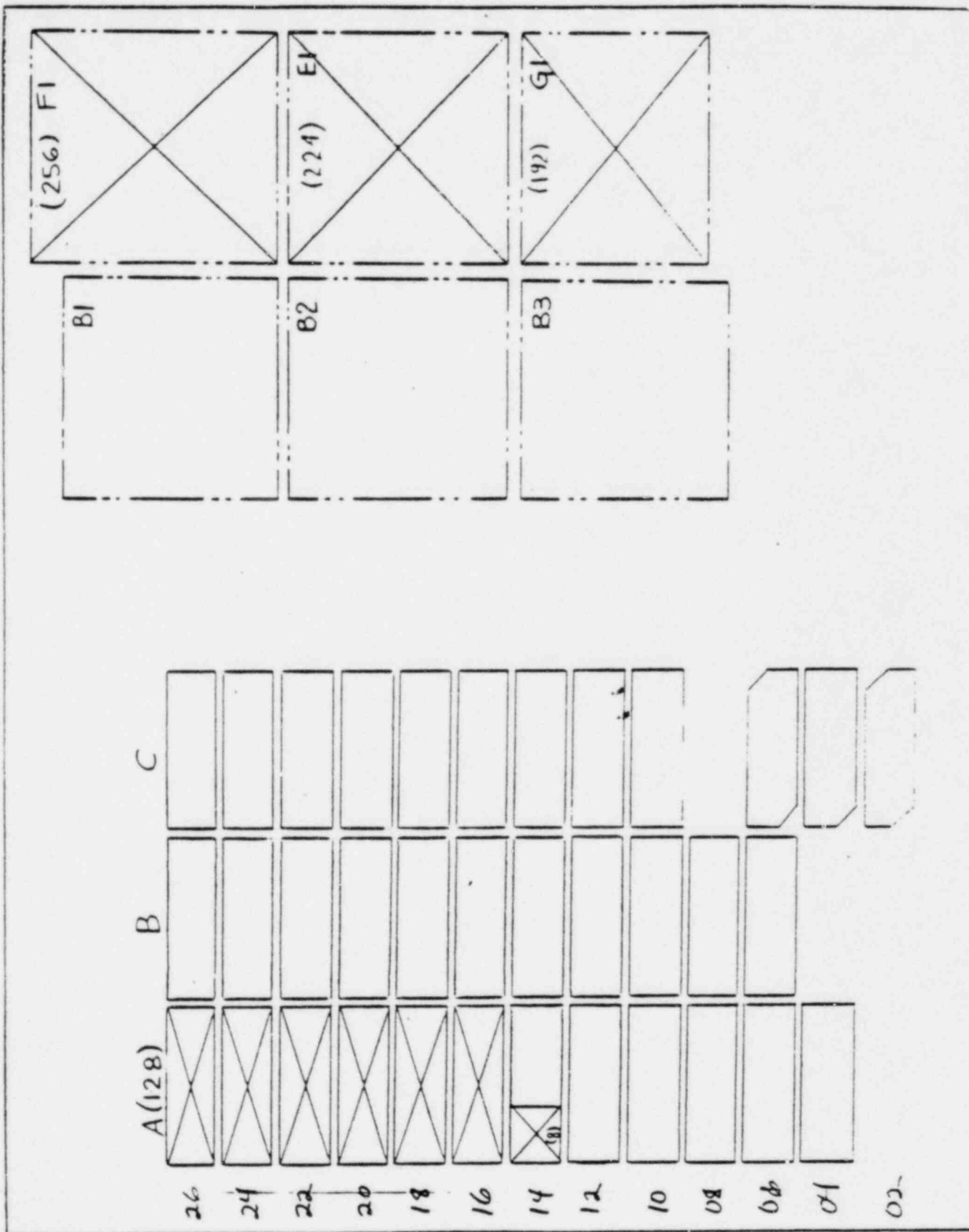
UNIT ONE



UNIT ONE



UNIT ONE



	A	B
26		
24		
22		
20		
18		
16		
14		
12		
10		
08		
06		
04		
02		

C1

(128) B1

(256) F1

C2

B2

(224) E1

B3

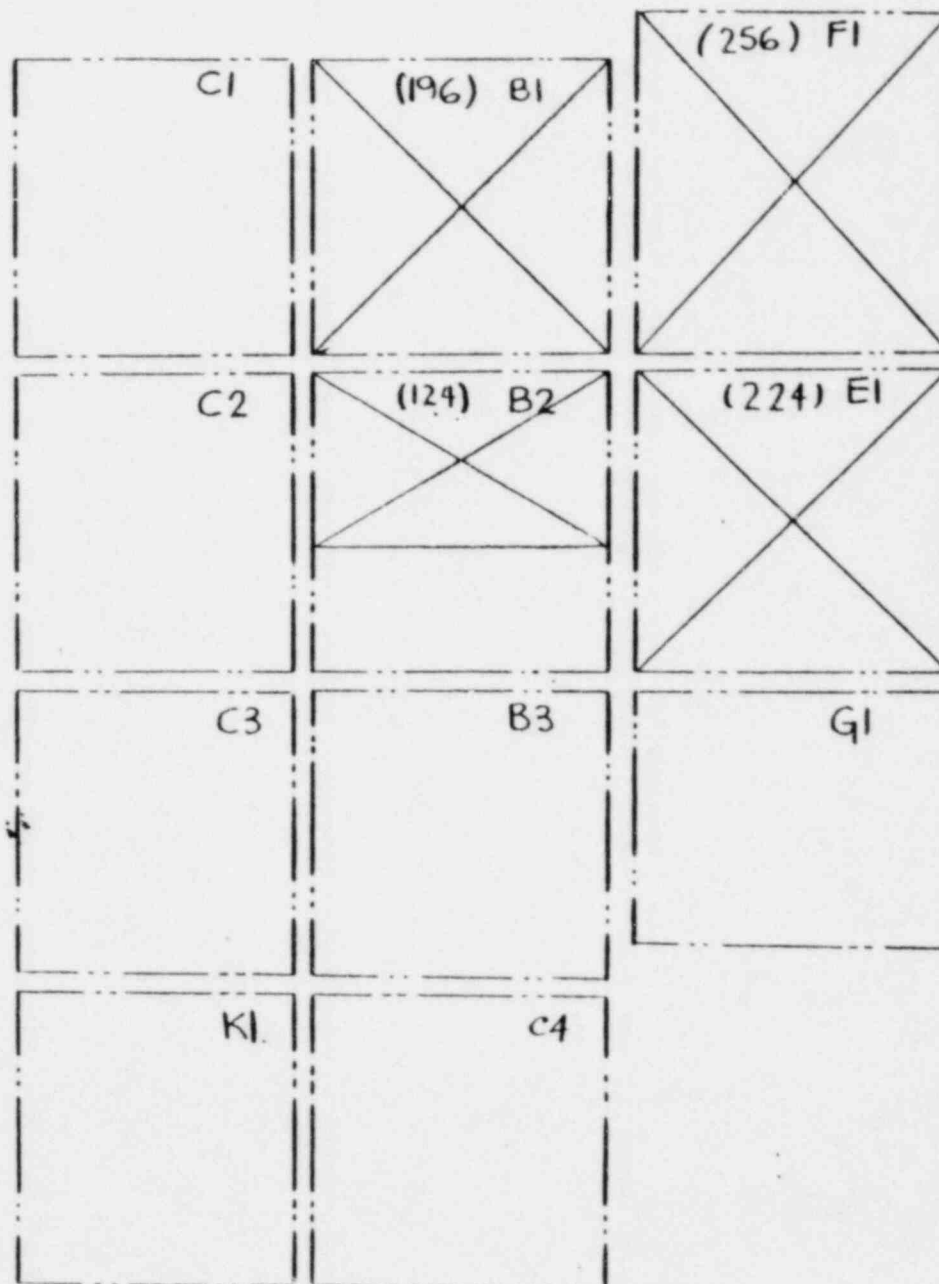
(192) G1

UNIT ONE



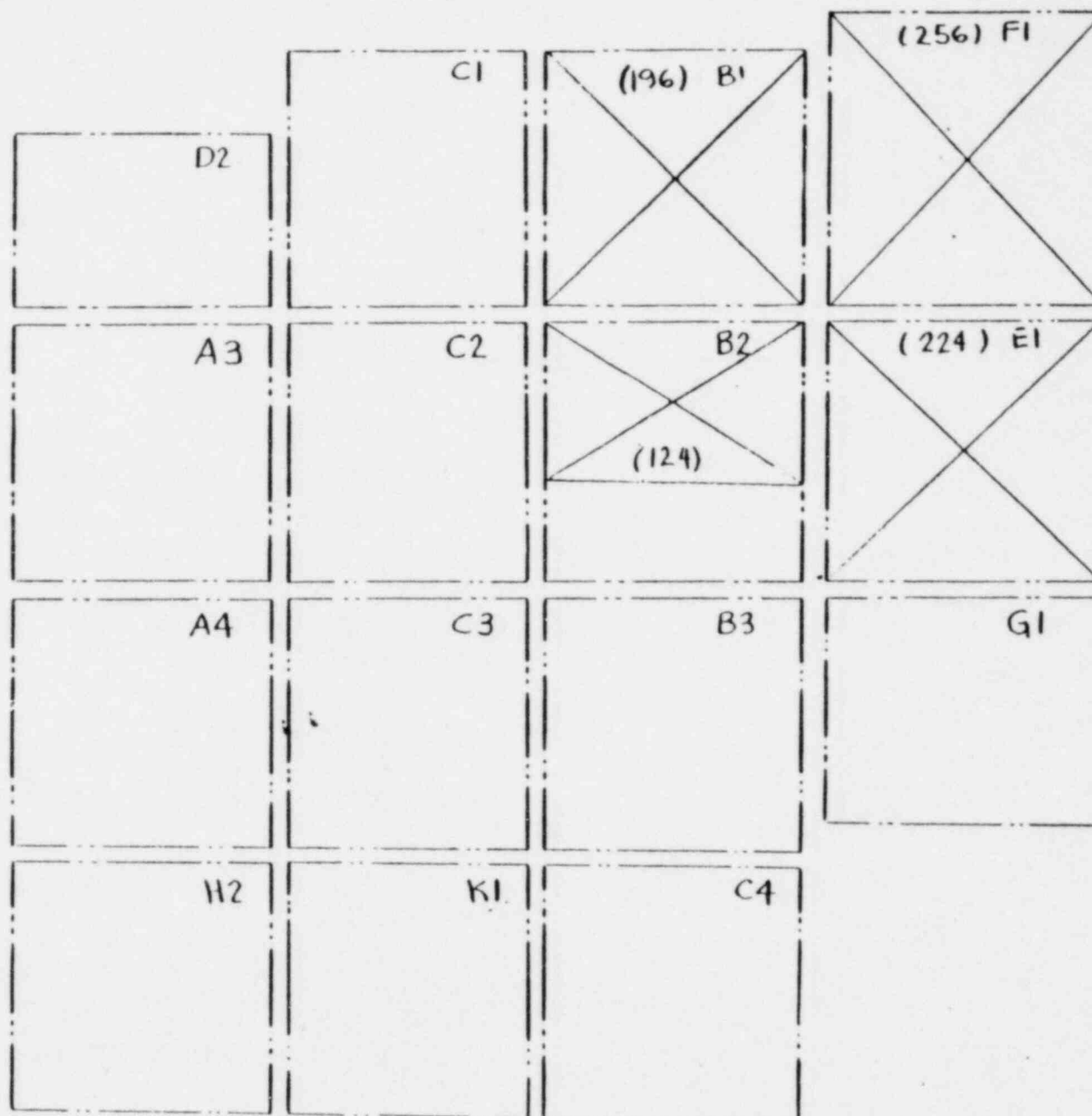
-16-

A
08
06
04



QFP 1100-4
Revision 1

UNIT ONE



08 A

06

04

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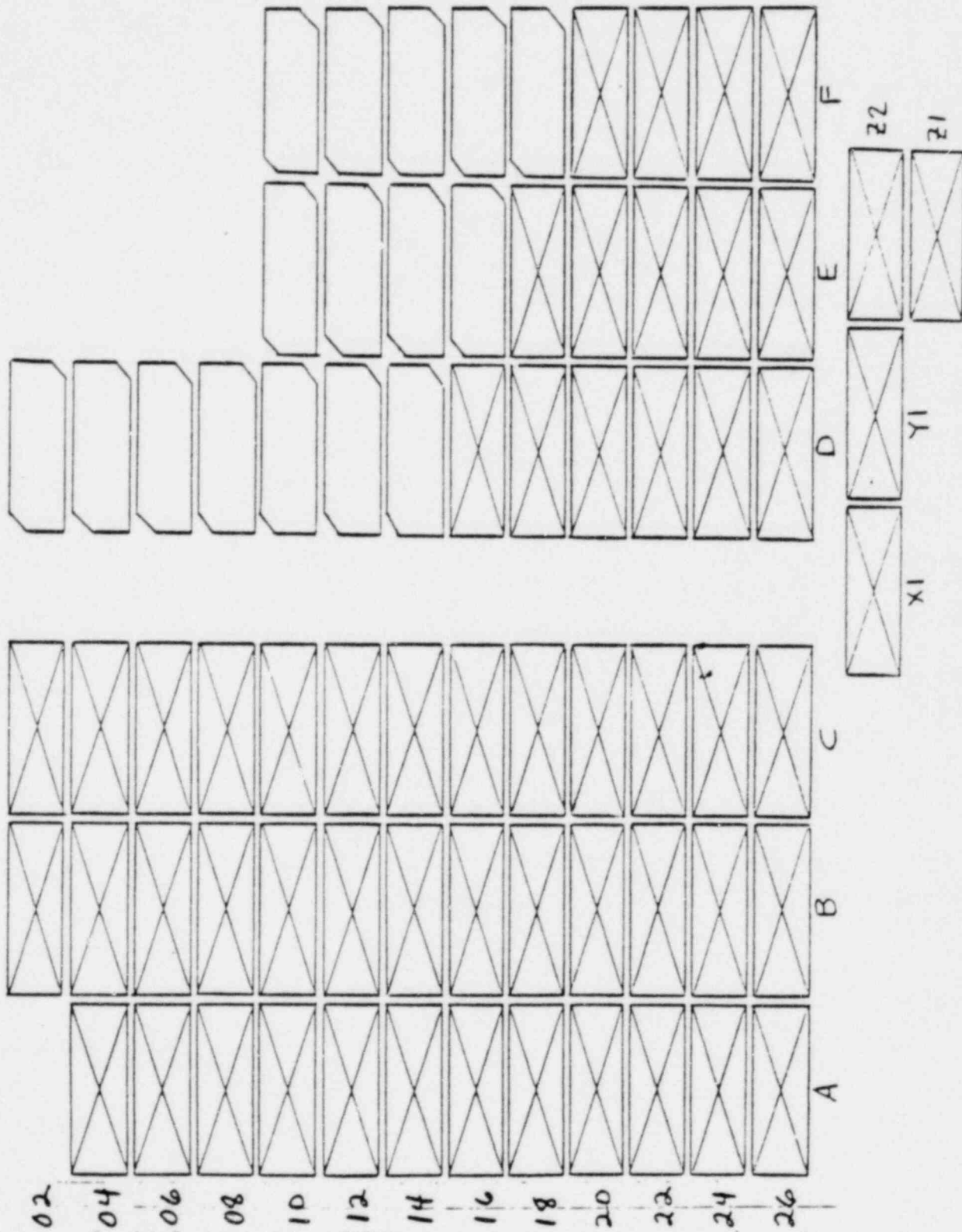


FIGURE 9

UNIT ONE

(182) C1	(196) B1	(256) F1
(76) C2	(196) B2	(224) E1
C3	(196) B3	(192) G1
K1	(182) C4	

A

08

06

04

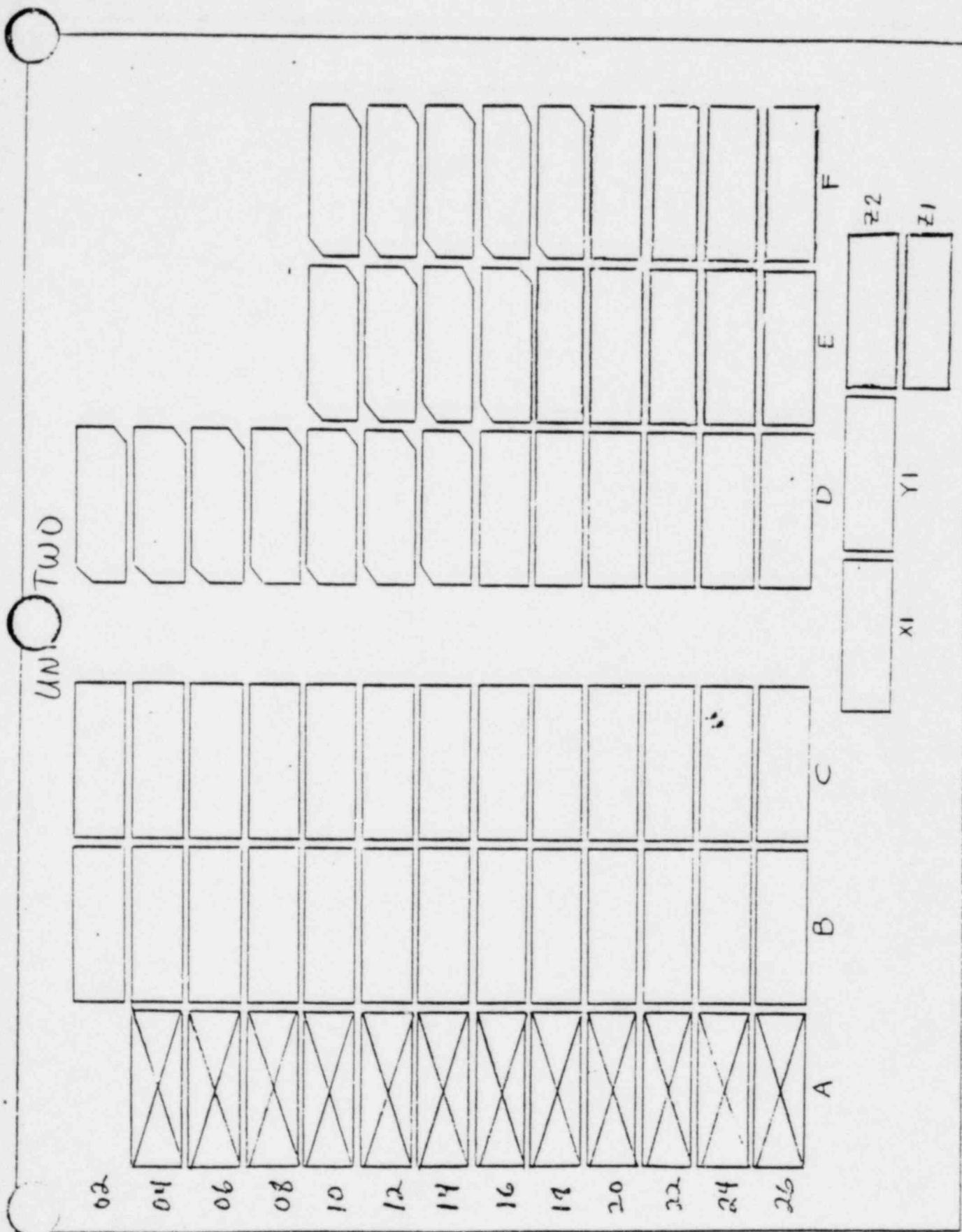


FIGURE 11

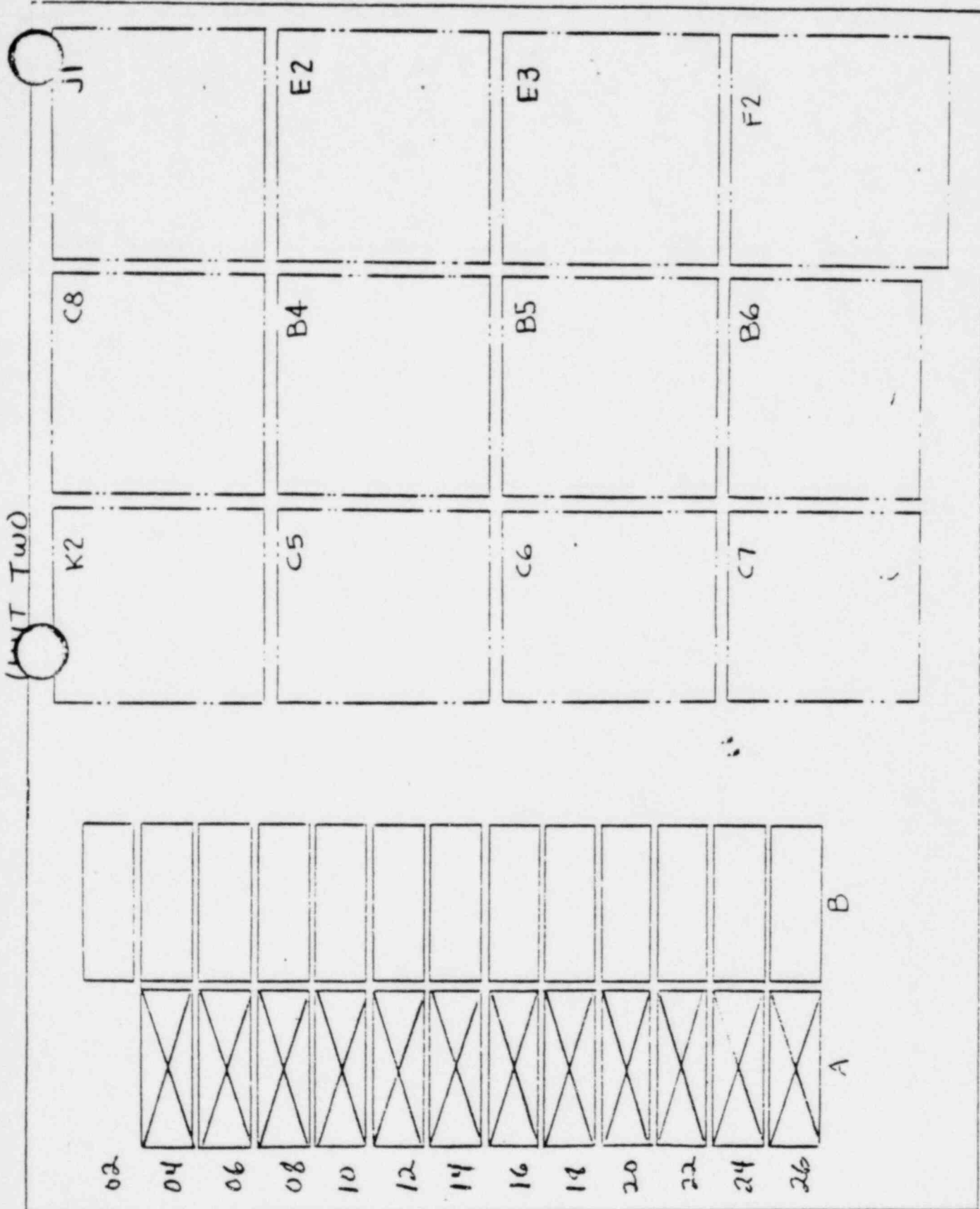


FIGURE 12

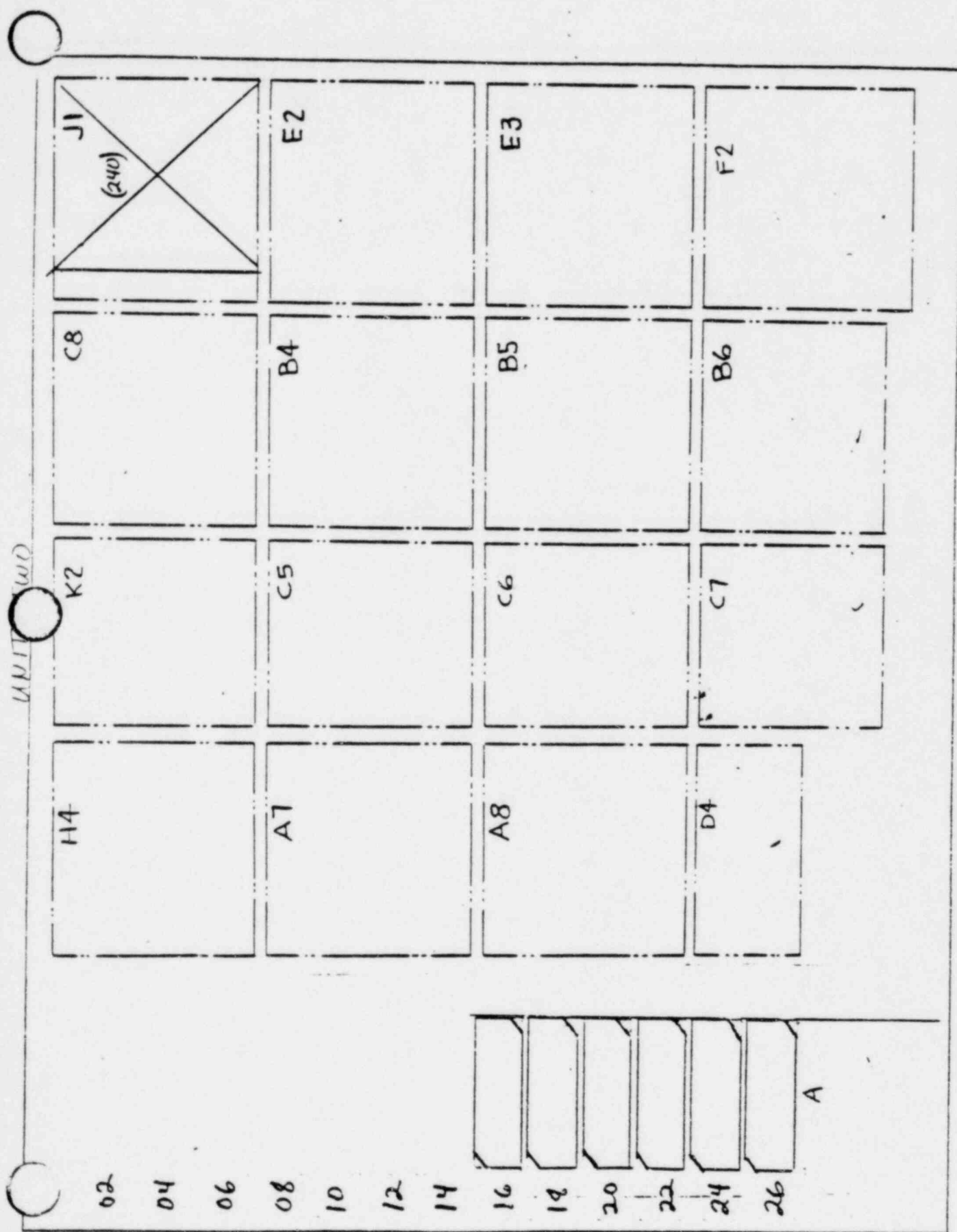
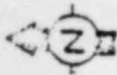


FIGURE 13

G. CHECKLISTS

1. None.

H. TECHNICAL SPECIFICATION REFERENCES

1. Section 3.10.c.