

70-58

NUCLEAR  
DIVISION  
Baltimore,  
Maryland  
21203

**MARTIN COMPANY**

Mail No. 845  
March 3, 1965

Refer to:  
ACC-380

U. S. Atomic Energy Commission  
Division of Material Licensing  
Washington, D. C.

Attention: Mr. Kenneth Lauterbach

Subject: Proposed Amendment to Special Nuclear Material  
License No. 53

Gentlemen:

The Martin Marietta Corporation hereby submits an applica-  
tion for amendment to special nuclear material license No. 53  
to permit storage of MH-1A fuel elements at the Martin Critical  
Facility prior to and after the performance of criticality  
experiments. Since the handling of fuel and actual experimenta-  
tion have been approved under Martin Facility License CX-7, this  
request is for specific approval for the storage of the fuel.  
Should it be necessary to store the low enriched MH-1A fuel at  
the Critical Facility for an extended period of time we will  
submit additional pages to be included in our recent SNM-53  
renewal application.

We will need approval of this proposed amendment no later  
than March 12, 1965 and thank you for your usual prompt  
attention to this matter.

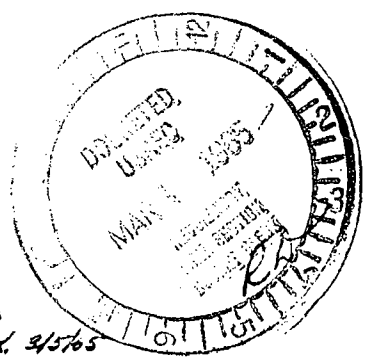
Very truly yours,

MARTIN MARIETTA CORPORATION  
MARTIN COMPANY - Nuclear Division

*C. W. Keller*

C. W. Keller  
Nuclear Accountability  
& Licensing Representative

CWK:mal



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2 Copy Provided Compliance  
104 CB, 104 PDR K.O.L. 3/5/65



70-58

SPECIAL NUCLEAR MATERIAL LICENSE NO. 53  
PROPOSED AMENDMENT

Introduction:

The MH-1A fuel elements will be stored in Test Cell 1 at the Critical Facility prior to and after the Preshipment Test Program. A floor plan of the Critical Facility is shown in Fig. 1. Each element will be placed in a storage container specifically designed for MH-1A fuel bundles. The storage container will be spaced on a minimum 24 inch center-to-center separation. A total of 36 MH-1A fuel elements will be stored in Test Cell 1.

MH-1A Fuel Element:

The MH-1A fuel element consists of 104 fuel rods positioned on a square pitch of 0.654 inches. Two uranium enrichments are used in the MH-1A core. However, all fuel rods in any element contain uranium of the same enrichment. The design specifications for the fuel rods are as follows:

Material	UO <sub>2</sub>
U-235 content	39.9 and 41.0 grams
Enrichments	4.07 and 4.65 W/O
Fuel rod dimensions	
Length	42.5 inches
Diameter	0.507 inches
Fuel dimensions	
Length (pellet)	0.5 to 1.0 inches
Length (active fuel rod)	36 inches
Diameter (pellet)	0.438 inches
Clad thickness	0.025 inches
Clad material	316 M stainless steel

The total U-235 content per fuel element is 4.26 kg. for the high enriched elements and 3.73 kg. for the low enriched elements.



## Cell 1

Test Cell 1 is a 20 x 20 x 20 foot room constructed of one foot thick exterior concrete walls, two foot thick interior concrete walls and nine inch concrete roof. Access to the test cell from within the facility is by a sliding fireproof door equipped with a 4-way combination lock. Outside access to the test cell is by means of a tamper-proof 10 x 12 foot steel roll-up equipment door. A floor plan of test cell 1 indicating storage of MH-1A fuel elements is shown in Fig. 2.

The MH-1A fuel elements will be stored around the test pit in Cell 1. All water lines in the test cell have been externally disconnected and plugged.

## Storage Containers

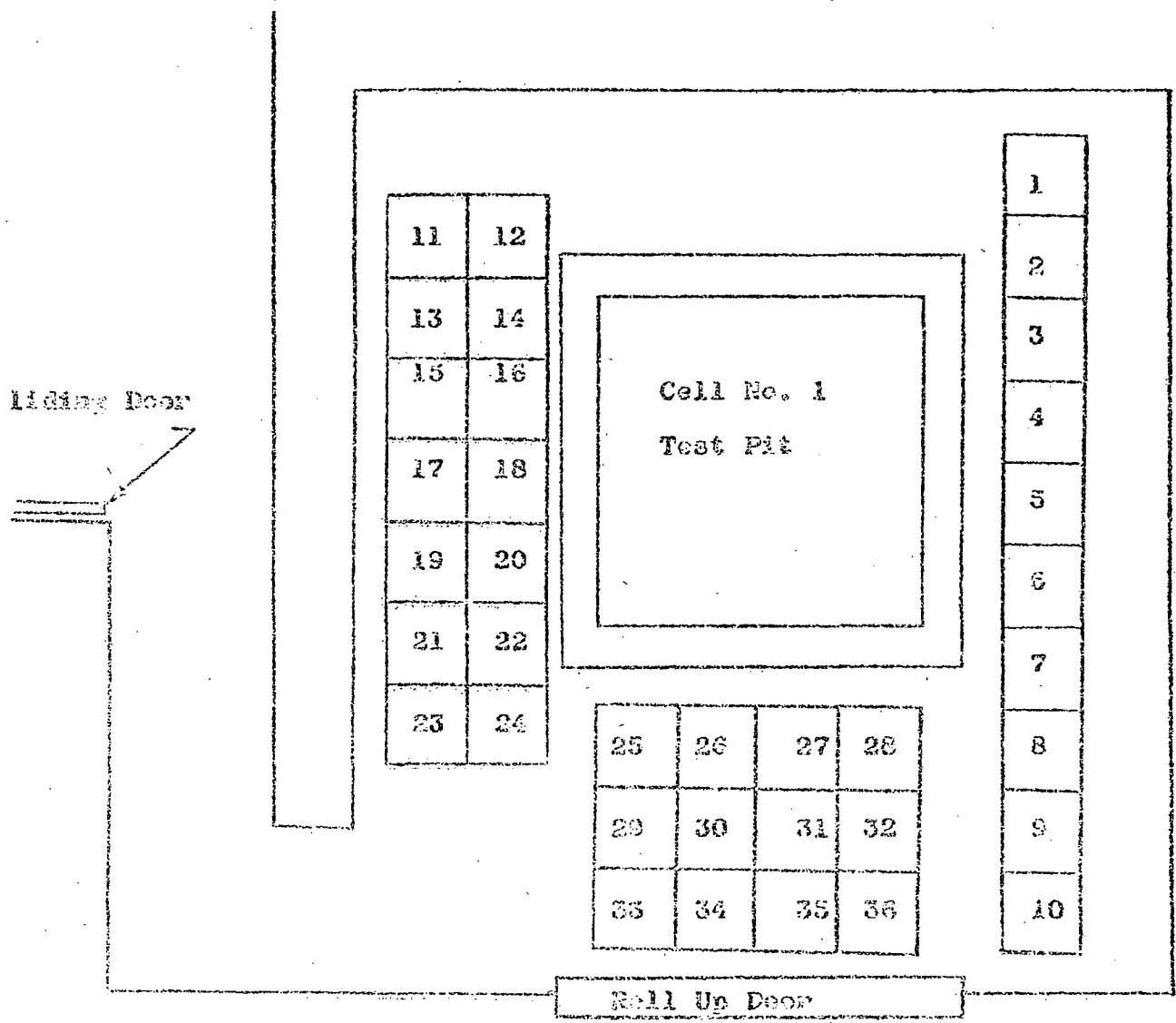
The storage container consists of a 10 inch diameter schedule 20 carbon steel pipe welded to a 24 inch square carbon steel base plate. Eight brackets are welded each 45° circumferentially from the outer edge of the base plate to the center pipe. These brackets maintain the minimum 24 inch separation. A typical storage container is shown in Fig. 3.

## Collisional Evaluation

The nuclear safety evaluation for MH-1A fuel storage was based on data given in TID-7018, Rev. 1, Fig. 22. For a 24 inch center-to-center spacing the total allowable number of vertical units in a cubic array is 70 assuming a thick shock-fitting reflector about the array. Since the  $\beta/\alpha$  ratio for MH-1A fuel elements is less than 1, the necessary requirements listed in Table IV of TID-7018 are satisfied for the storage of MH-1A fuel elements. Test Cell 1 is designated as a fuel storage area in which access is controlled and all water sources have been removed.

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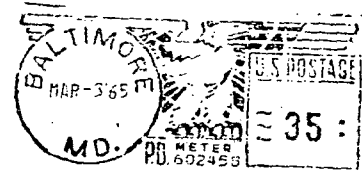
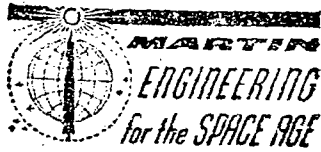
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Storage of MW-1A Fuel Elements in Test Cell No. 1

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Washington, D. C.

Attention: Mr. Kenneth Lauterbach

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