BURN PITS, SPILLWAYS, AND SPILL AREAS (Con't.)

Material of construction for pits, spill areas and spillways is "Fondu-Fyre Concrete, Type WA-1", plastered in place to give a jointless, refractory surface. Fondu is not entirely resistant to all chemicals; however, use of the water wash-down facilities provided at the spill areas will deter etching action.

TILT TABLES

Transfer of propellants from drum containers to burn pits is assisted by two tiltable tables located at the spill areas. These tables are constructed of stainless steel structural shapes, electrically grounded, and each is capable of handling from one to three drums in one dump operation. Tables are individually tilted by pneumatically powered mechanisms remotely controlled from the control stations. Each tilt system consists of a GN_2 supply, two double-acting cylinders attached to linkages on the table, a 4-way manually operated selector valve which permits inching control of cylinders in either direction, a pressure regulator, a relief valve to handle full regulator capacity, a shut-off valve, and necessary plumbing. Plumbing and components in the vicinity of tilt tables are shielded against propellant spillage and flush water.

The following outlines a typical dump operation.

Operator deposits drums onto tilt table using a fork lift or such other handler.
Hold down straps are secured around each drum and bungs removed.
Operator retreats to the control station behind the protective wall to operate tilt controls.
Drums are emptied and table is righted.
Operator returns to the tilt tables and unfastens hold-down straps.
Drums are removed from the table by the handler and delivered to the adjacent rinse area to be purged, if they are classified as "returnable", or delivered to the burn pit to be included in the burning.

The preceding steps are repeated for each dumping until the number of drums allotted for each burning are emptied.

Tilting operations may be continually observed through viewing windows located at the control stations.

IGNITION

Materials in the burn pits are remotely ignited from the two control stations located behind the protective walls. Two complete systems are provided; one servicing each pit. Each system consists of an oxygen and acetylene supply, plumbing to a nozzle directed at the pit, wiring to a spark plug located within the nozzle, a D.C. power supply, controls to excite the spark plug, and valves to regulate the acetylene flame.

IGNITION (Con't.)

Size of acetylene flame, ignition of materials and subsequent burning may be observed through viewing windows located at the control stations.

PROTECTIVE WALLS

Two parallel concrete block walls, 25 feet apart and 10 feet high protect operating personnel and storage areas from exposure to hazards incurred during disposal of materials in the burn pits.

PAVING

Approximately 20,000 sq. ft. of asphalt paving includes the access road from the entrance gate, service and storage areas, and roadways of 10 ft. minimum width to the various facility components.

Concrete paving is provided in the spill area between the two protective walls, and for the service pad at the burn pits.

LIGHTING

A general lighting system is included to permit night operation of any of the disposal facilities.

IOL To: W. C. Wensel FE60-8571
From: W. Bodnar 20 October 1960
Subject: Hazardous Material Disposal Facility Page 4

The following is a cost summary of the facility components:

OK	Burn pits, spillways, spill areas (Fondu only)	$ 9,500
✓	Concrete Block walls (including 2 windows)	2,000
✓	Concrete pads and paving	1,500
✓	Asphalt concrete paving	4,000
✓	Excavation and grading	600
✓	Fencing (1200 ft. incl. gate) Barbed wire	2,800
X	Lighting	5,000
✓	Valve pits, flush and drainage systems	2,500
	Catch basin	1,000
	Tilt tables and operating mechanisms (less penumatic supply)	2,600
	Ignition systems (less gas supply & battery)	1,700
	Control stations (less controls)	200
	Multi-jet Shower	300
	Windsock	---

Shack, GN_2 supply & battery, oxygen and acetylene supply, pallets and fork lift - all furnished by North American.

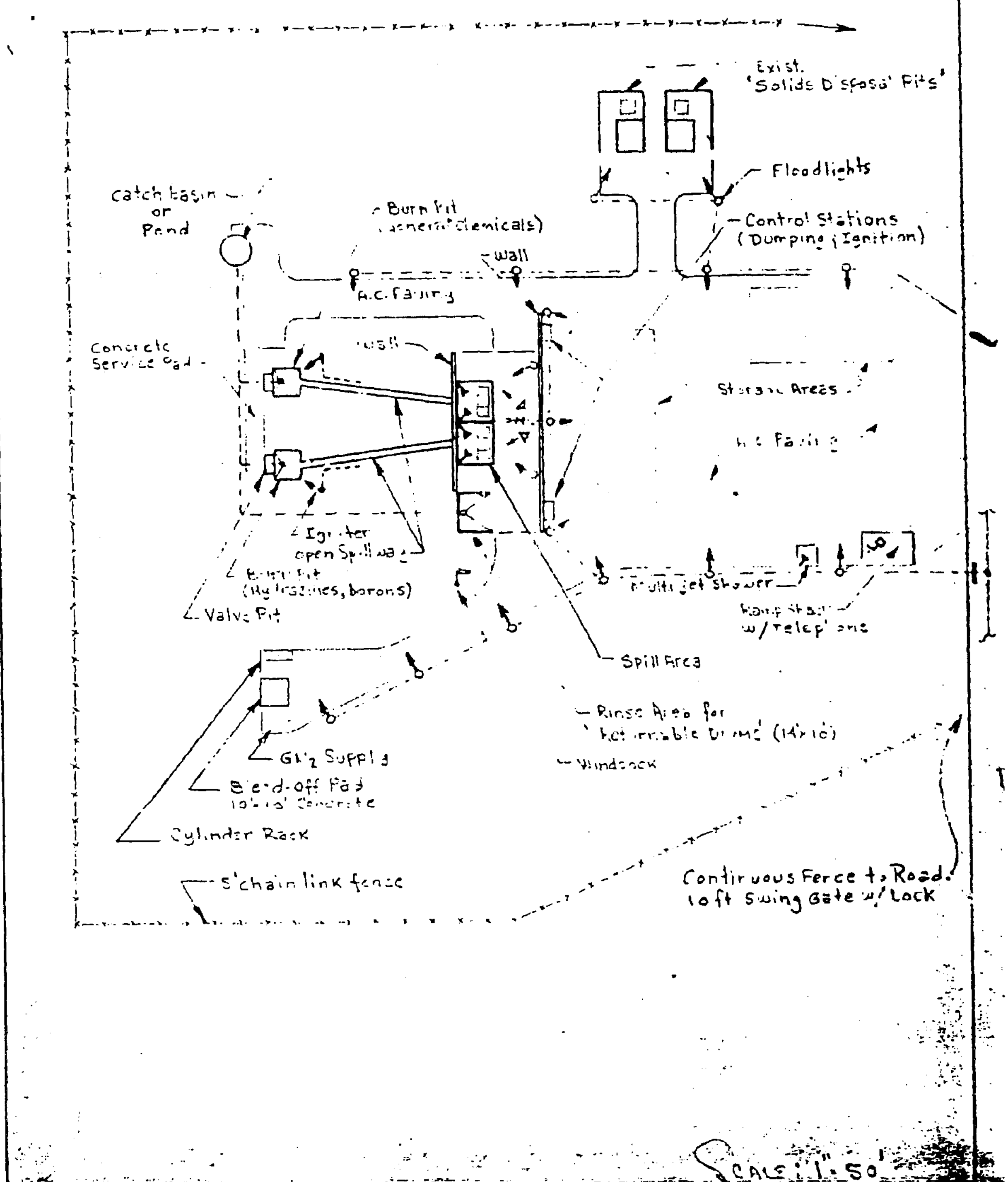
Approved: R. E. McClellan
R. E. McClellan
Supervisor
General Design

W Bodnar
W. Bodnar
Facilities Engineering

REMC:WB:re

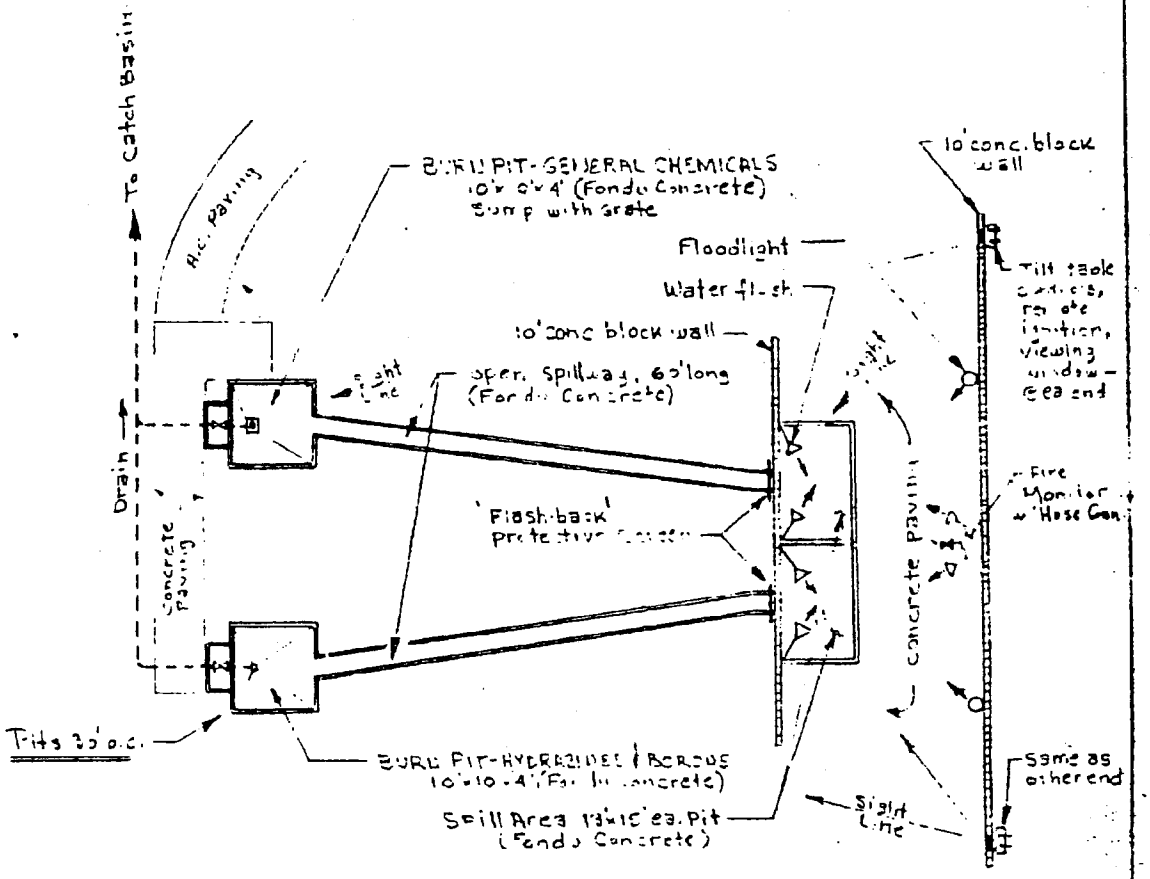
dc: A. E. Moore D583 Vanowen
S. A. Miller D552-05 SanSu
R. J. Madden D552 SanSu
D. J. Jolicoeur D596-62 SanSu
E. T. Higgins D551 SanSu

PREPARED BY W Bodnar	**ROCKETDYNE** A DIVISION OF NORTH AMERICAN AVIATION INC	PAGE NO. 1 OF 5
CHECKED BY	PFL - HAZARDOUS MAT'L DISPOSAL FACILITY	REPORT NO. [illegible]
DATE 8-30-62	GENERAL ARRANGEMENT	MODEL NO.

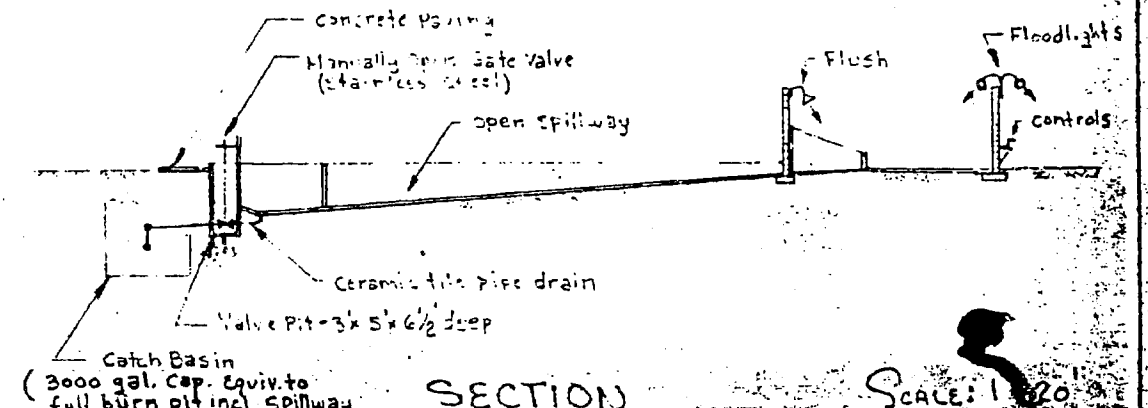


PREPARED BY: W Bodnar	ROCKETDYNE A DIVISION OF NORTH AMERICAN AVIATION INC	PAGE NO 2 OF 5
CHECKED BY:	PFL – HAZARDOUS MATL DISPOSAL FACILITY	REPORT NO 9009596
DATE: 8-26-60	BURN PITS: PLAN & SECTION	MODEL NO

FIRE RESISTANT MATERIAL — Fondu Fyre Concrete Type UA-1

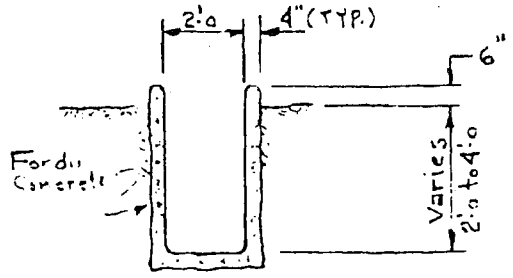


PLAN

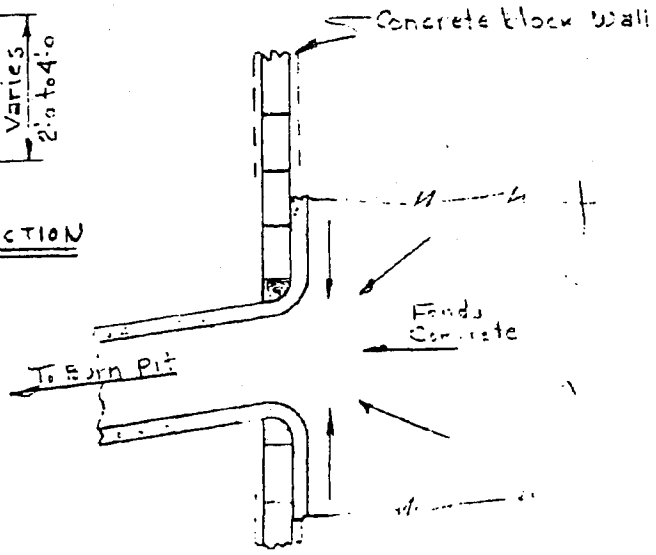


SECTION SCALE: 1" = 20'

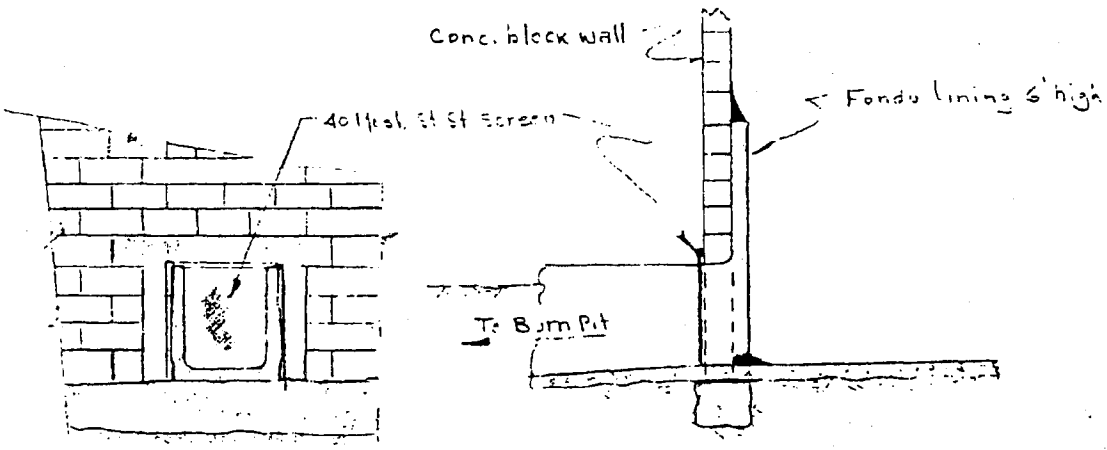
PREPARED BY: W Bodner	**ROCKETDYNE** A DIVISION OF NORTH AMERICAN AVIATION INC	PAGE NO 3 OF 5
CHECKED BY:	PFL – HAZARDOUS MATL DISPOSAL FACILITY	REPORT NO 8000595
DATE: 8-29-60	SPILLWAY DETAILS	MODEL NO



TYPICAL SPILLWAY SECTION



PLAN



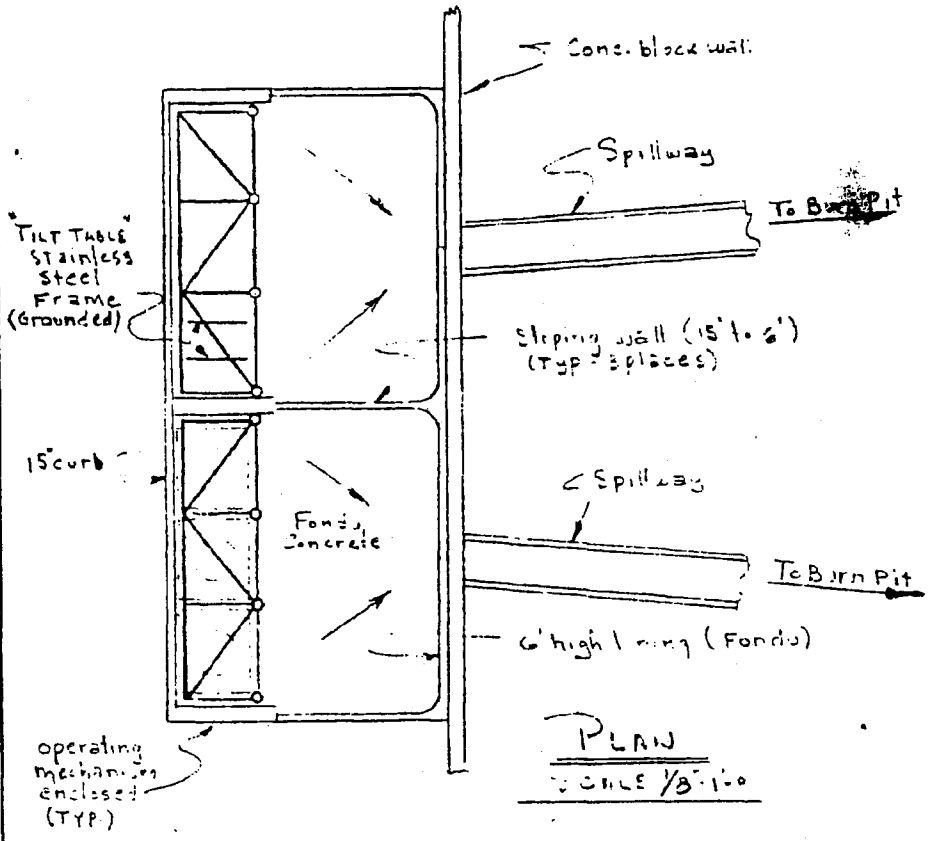
FRONT VIEW

SIDE VIEW

DETAILS @ WALL

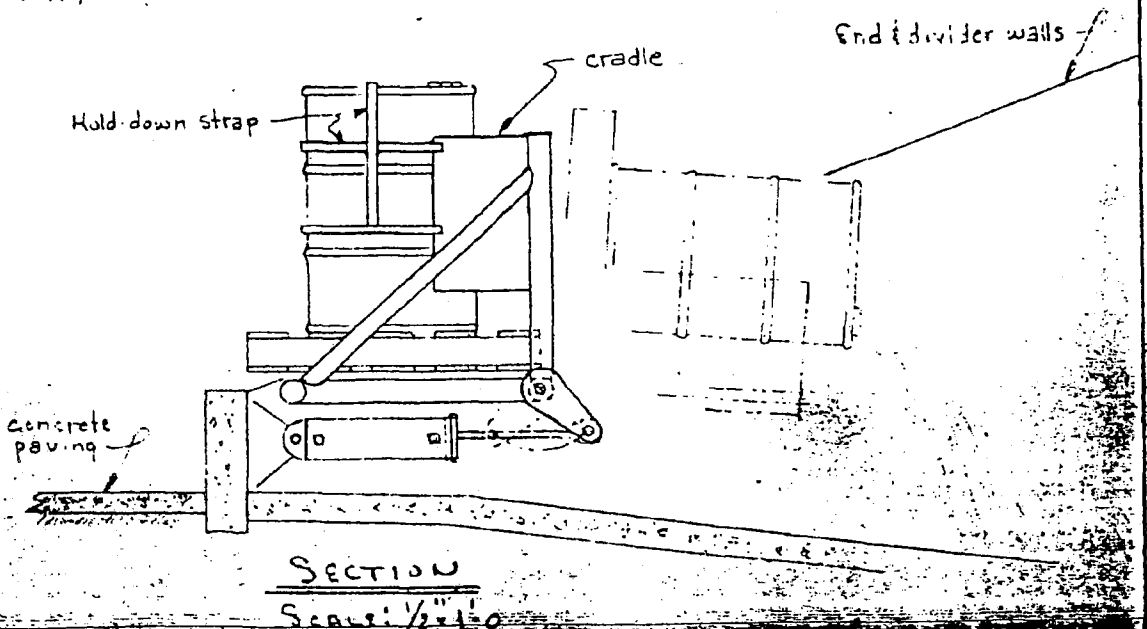
Scale 1/4"=1'-0"

PREPARED BY: W Bednar	**ROCKETDYNE** A DIVISION OF NORTH AMERICAN AVIATION, INC	PAGE NO. 4 OF 5
CHECKED BY:	PFL - HAZARDOUS MAT'L DISPOSAL FACILITY	REPORT NO. S-000-96
DATE: 8-26-60	SPILL AREA & TILT-TABLE DETAILS	MODEL NO.



PLAN

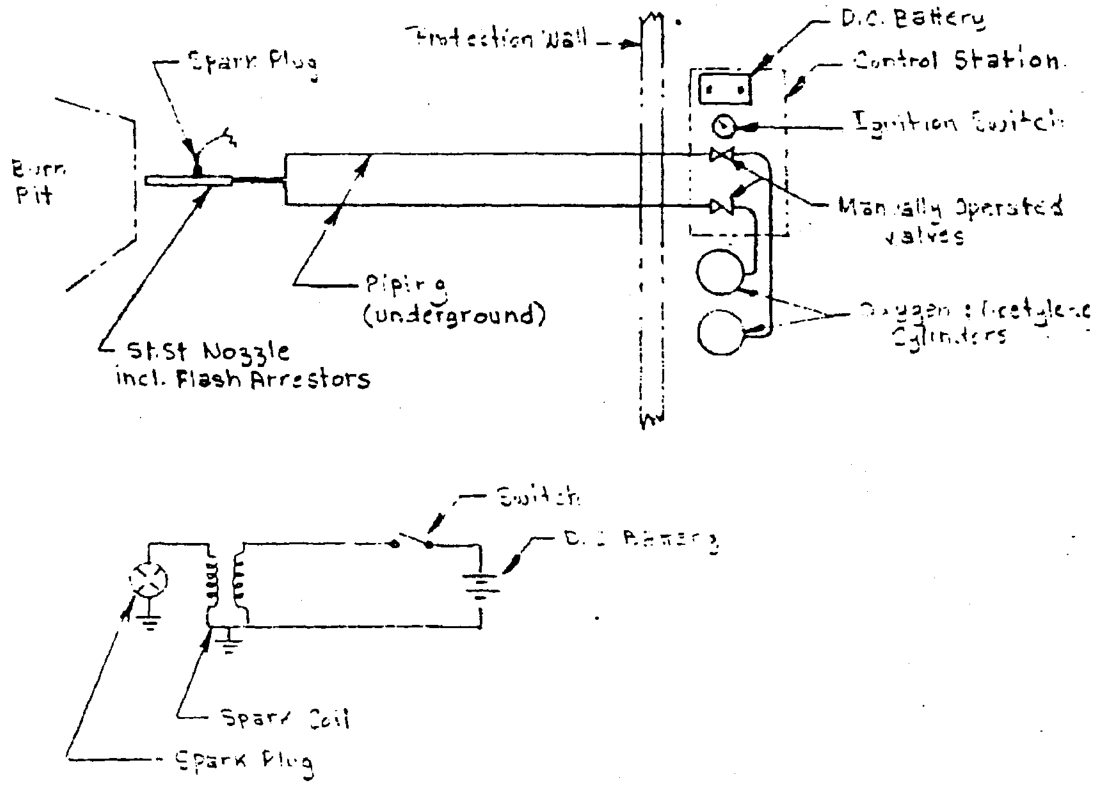
SCALE 1/8"-1'-0



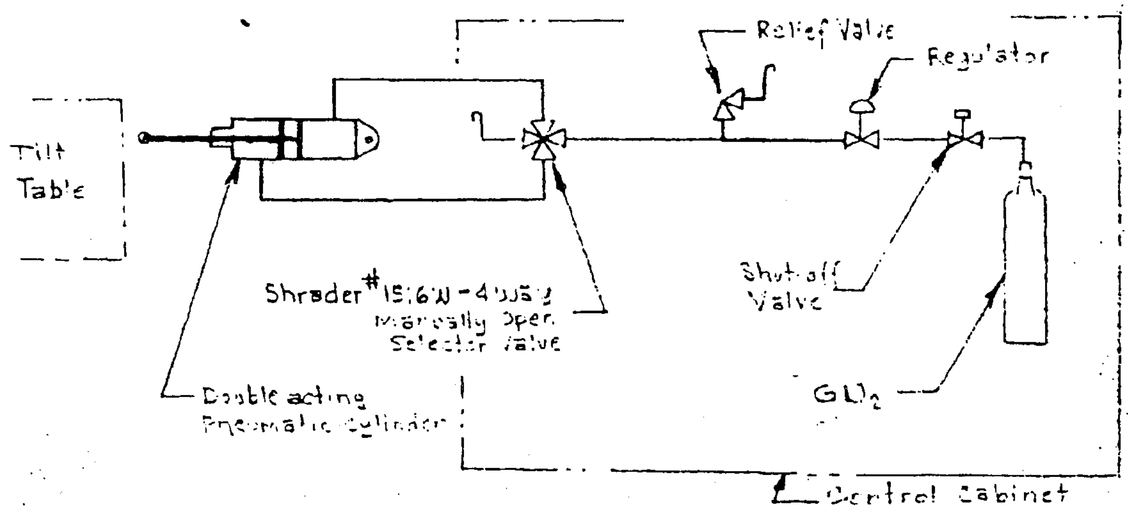
SECTION

SCALE: 1/2"-1'-0

PREPARED BY: W. [illegible]	ROCKETDYNE A DIVISION OF NORTH AMERICAN AVIATION, INC.	PAGE NO. 5 OF 5
CHECKED BY:	PFL- HAZARDOUS MAT'L DISPOSAL FACILITY	REPORT NO. 8285 526
DATE 10-7-62	CONTROLS - SCHEMATICS	MODEL NO.



IGNITION



TILT TABLE

ROUGH DRAFT

ROCKETDYNE

A DIVISION OF NORTH AMERICAN AVIATION, INC.

Industrial Security Division

Fire Department

ORDER : GENERAL FACILITY: SSFL

FROM : CHIEF O. C. LEDBETTER DATE :

TO : FIRE PERSONNEL

FILE : R-31-17

SUBJECT : CHEMICAL DISPOSAL OPERATIONS, SSFL,
INSTRUCTIONS AND SAFE OPERATING PROCEDURE (REVISED)

PURPOSE: 1. To establish a Safe Operating Procedure at the Chemical Disposal Area prior to, during and following disposal operations.

2. Maintenance of Good Housekeeping Practices.

I. GENERAL DESCRIPTION AND USES

The equipment available and design of the area is to safely dispose of waste propellants, chemicals and explosives.

It must always be borne in mind that the disposal of this material is a serious undertaking. Safe practices must be exercised at all times and nothing should be taken for granted. If the equipment is used properly and stored properly when not in use, malfunctions or accidents will be prevented.

There are pits to contain special liquids, burn cages for solid propellants, metal trays for perchlorates, tubes for pyrophoric igniters, a demolition box, a GN2 system for controlled pressurizing of cylinders and vessels and a 30-06 rifle with armor-piercing shells for penetrating defective or non-returnable vessels that have contained extremely toxic material, i.e., pentaborane or boron compounds.

II. DISPOSAL FACILITIES - USES

There are four (4) disposal pits, each to contain special liquid materials, Pits #1, #2 and #3 are identified from left to right as you would face the block house. Pit #4 is located about 150 feet southwest of the block house.

A. Pit #1 - Hydrazine and the various admixtures, i.e., UDMH, Hydyne, MMH, etc.

II. A. Pit #2 - Conventional fuels and liquids, i.e., jet fuels, gasoline, alcohol, heptane, paint thinners, lubricating and hydraulic oils, resins, solvents, etc.

Pit #3 - Liquid oxidizers, i.e., NTO, IRFNA, Nitric Acid, etc.

Pit #4 - Pentaborane, boron compounds and solid fuels.

B. Burn Cages

There are two (2) metal burn cages designed for the disposal of solid propellants, pyrotechnic igniters, electric squibbs, etc., and contaminated waste paper and rags.

NOTE: Refer to "SOLID PROPELLANT DISPOSAL" Procedure #16 of Section 10, in the Fire Department Order Manual.

C. Perchlorates Tray

There is one (1) large tray to contain the various perchlorates either in solid form or in solution. This tray is located near the burn cages.

D. Pyrophoric Igniter Disposal Tube

This tube is used to dispose of pyrophoric igniters. It can contain approximately twenty (20) igniters in a horizontal position submerged in fuel.

E. Pressurizing System

This system is designed to charge cylinders or vessels with GN2 necessary to bleed-off miscellaneous liquid and gaseous chemicals when the control valves are operable. Component parts of the system are a "Grove" regulating valve, pressure gauge and check valve.

III. PLACING DELIVERED DISPOSABLE MATERIAL

A. Place or have the material placed near the appropriate location.

B. Contact the Lieutenant in charge of Inspections if it is not known where material should be placed.

C. In all instances, the Inspection Section will be notified by memo as to what has been placed in the area on second and third shifts.

IV. SAFETY REGULATIONS

A. Personnel Hazards

The principal hazards associated with these materials are:

IV. SAFETY REGULATIONS

A. 1. Exposure or contact of the body or eyes to the liquids or vapors.

2. Inhalation of the vapors.

3. Fire/explosion hazard.

B. Personnel Protection

1. Head and body

a. Toxic or corrosive liquids or gases.
Full Gra-lite suit and hood.

NOTE: For Hydrazine or the admixture disposals, under proper conditions, Gra-lite open back aprons with face shield and hard hat may be used with permission. For use contact supervision.

b. Conventional hydrocarbons

1. Gra-lite open back aprons, face shield, hard hat.

c. Pyrotechnic-Pyrophoric Igniters.

1. Hard hat, face shield, flame proof open back apron.

2. Feet and Hands

a. Toxic or corrosive liquids or gases.
Neoprene boots - Neoprene gloves.

b. Conventional hydrocarbons.
Neoprene boots - Neoprene or vinyl coated gloves.

NOTE: Cotton work gloves may be used for drum handling.

c. Pyrotechnic and Pyrophoric Igniters.
Neoprene boots, asbestos gloves.

3. Air Source

a. Toxic or corrosive liquids or gases.
Self contained air breathing equipment.

NOTE: Special MSA cannister type breathing equipment may be used, with approval, for Hydrazine or the admixture disposal. For use contact supervision.

V. PRE-DISPOSAL REGULATIONS

Not less than two (2) men must participate in the preparation and disposal operation at all times.

No disposal operation will commence without the approval of the Lieutenant in charge of inspections or notification to Protective Services Control Center.

V. A. Prior to attempting disposal operations, personnel assigned will:

1. Using the area yellow phone contact Operations Surveillance for disposal clearance.

2. Check the area wind conditions, confirm this with Operations Surveillance.

3. Using the area red phone notify Control Center of disposal assignment.

B. Preparation

With disposal clearances obtained:

1. Lay out and check fire hose lines, charge same.

2. Test safety shower.

3. Check safety clothing and equipment.

4. Check conditions of pits, trays, etc., to be used. Clean and/or drain same if necessary.

5. Test the operation of equipment and tools to be used.

6. Test the fixed water spray nozzles - adjust if necessary.

7. If used, water spray the black top for maximum static grounding.

8. Notify Plant Services if repairs are necessary.

9. Clear area of unauthorized personnel.

10. Secure area entry cable gate.

11. Lower yellow flag - raise red flag.

VI. DISPOSAL AND BURNING

1. Utilize and wear required safety clothing and equipment.

2. Exercise caution when handling and dumping drums, handling and placing explosives or defective chemical cylinders. Remove bungs from drums SLOWLY.

a. Do not lean over a venting drum or container to open another.

b. Keep at arms length when removing bungs from drums or containers.

3. Practice the "Buddy System" at all times.

4. Notify Operations Surveillance and the Protective Services Control Center approximately five (5) minutes prior to dumping chemicals or igniting fuels.

VI. DISPOSAL AND BURNING

5. Remain in the Block House when disposing of materials and when igniting. Remain 150 feet away from cylinders being ruptured by ammunition.

6. Remove empty drums immediately to a safe location.

7. Maintain the work area clear of incumbrances.

8. Observe smoke, and vapor conditions. Also, note change of wind direction. If smoke or toxic vapors drift toward CTL III, V or Coca suspend operations immediately and notify Operations Surveillance. Be guided by their instructions.

9. Observe for any unusual conditions.

10. Should any problem or abnormal situation occur, Protective Services Control Center and the Lieutenant in charge of Inspections should be notified immediately and all activities discontinued until his evaluation of the problem is determined.

VII. SECURING THE AREA

A. See that all hydraulic valves on the dumping mechanism are closed.

B. Lower red flag and display yellow flag when safe to do so.

C. Restore all tools and equipment in proper location, clean and ready for subsequent use.

D. Notify Operations Surveillance and the Protective Services Control Center that disposal operations have been completed.

E. Place and band empty drums, cylinders etc., on pallets ready for pick-up.

F. Clean up the area; practice good housekeeping.

G. Secure the area.

H. Report defective safety equipment, tools, etc., in need of repair or replacement.

VIII. METHOD OF DISPOSAL

A. Hydrazine and Admixtures - Use Pit #1

1. Utilize the remote drum tilting mechanism, designed specifically for such use.

2. Do not dump any other fuels, i.e., hydrocarbons, alcohols, thinners, acids, etc., in this pit at any time.

VIII. METHOD OF DISPOSAL

A. 2. (It must be maintained as clean as possible to prevent and minimize the possibility of hypergolic ignition and the resultant flash-back).

3. No other drums, full or empty, will be near the tilt table when in use.

B. Conventional Fuels, Hydrocarbons, Paints, Thinners, Etc., Pit #2

1. Same as A.1 and A.3 above.

2. Do not dump Hydrazine and the various admixtures or acids in this pit at any time.

C. Nitrogen-Tetroxide, I.R.F.N.A., And Other Acids - Pit #3

1. Prior to disposing of these materials, the pit must contain an amount of water adequate for the job on hand. Generally, five (5) parts of water to one (1) part of acid will dilute the acid to a point when a dangerous action with foreign materials will not occur.

2. Sample quantities can be spilled into the pit with a 1½ inch hose line flushing the acid away from the container and at the same time diluting the acid before it enters the pit.

3. For drum quantities:

a. Lay out two (2) separate hose lines.

b. Put on safety clothing and equipment.

c. Place drum on acid sump, drain pad, bung up.

d. With first man on standby with charged hose line, second man will remove drum bung - SLOWLY.

(This allows internal pressures to be bled off).

e. With bung removed, second man will:

1. Place shower ring device on drum around the open bung.

2. Insert metal pipe water spray applicator into drum.

VIII. C. 3. f. When second man has departed drum area, first man, on command from second man, will actuate shower ring device.

g. Second and first man will actuate water line to applicator pipe - SLOWLY - using the road entry hydrant.

NOTE: APPLICATION OF WATER INTO THE ACID WILL CAUSE FUMING WITH AIR VENTING. THE SHOWER DEVICE WILL ASSIST IN THE DILUTION PROCESS. IT IS EXTREMELY IMPORTANT TO BE REMINDED THAT WATER INJECTED OR POURED INTO A CONTAINER OF ACID CAUSES HEAT TO BE GENERATED WITH POSSIBLE SPURTING OR ACID AND/OR VAPORS UNDER PRESSURE OUT OF THE OPENINGS. BEWARE OF TRAPPED VAPORS RELEASED SUDDENLY!

TO STOP OR CONTROL THE FUMING AND AIR VENTING PROCESS DISCONTINUE DRUM WATER APPLICATION.

h. With process under control, continue water application until all signs of acid venting has ceased and water color is normal.

i. When air venting has ceased and drum water color is normal, stop water application. Shut off water to shower device.

NOTE: Water left in drum is of a weak acid solution.

j. Drain drum water into acid catch sump.

k. Rinse off drum using copious amounts of water, remove drum from sump area to dry location.

D. Perchlorates, Nitrates and Other Solid Oxidizing Materials

1. Spread material in the large tray as evenly as possible.

2. Place a S.P.G.G. Igniter in the pan above the estimated liquid fuel surface.

3. Drain the fuel into the pan through the spill trough.

4. Allow a few minutes for saturation, then at a distance not less than 100 feet, ignite the mixture.

5. Not more than one (1) burn will be made the same day.

NOTE: An examination of the residue must be made the next work day to determine that a complete burn of the material has been accomplished. It may be necessary to make a second or possibly a third burn to completely dispose of the material.

E. Solid Propellants, Pyrotechnic Igniters:

1. Refer to the "Solid Propellant Disposal Procedure", as in 2-B above, and comply with the specific instructions contained therein.

F. Pyrophoric Igniters

1. Place same horizontally in the tube.

2. Fill the tube tray with liquid fuel.

3. Place a S.P.G.G. Igniter above the fuel surface.

4. Place the anti-shrapnel mat over the pan. Secure same against lifting.

5. At a distance not less than 100 feet, ignite the fuel.

6. The next work day, examine the cartridges for a complete rupture of both discs. It may be necessary to perform a second burn.

G. Pentaborane:

1. In Solution:

a. Spill material into the P.B. Pit. When drum is empty, roll it into the pit.

b. Place a S.P.G.G. Igniter above the fuel level.

c. At a distance of not less than 100 feet, ignite the fuel.

2. In Cylinders:

G. 2. a. Place the cylinders in an upright position in the P.B. Pit.

b. Drain as much fuel into the pit as necessary to insure a sustained burn.

c. Place a S.P.G.G. Igniter above the fuel level.

d. One (1) man at a distance of not less than 150 feet will ignite the fuel.

e. As soon as possible after assurance that the fuel is ignited, a second man will, at a distance of not less than 150 feet, fire at least two (2) 30.06 armor-piercing bullets into each cylinder as rapidly as possible.

NOTE: The bullet holes, in all probability, will slowly plug up with chemically formed boron-oxides. When this occurs, it will be noticeable by an unmistakable pressure build-up within the cylinder and a decrease in flame at the holes. It will then be necessary to penetrate the cylinder with as many bullets as required to prevent a rupture of the cylinder.

f. The next work day, it will be necessary to inspect the cylinders visually for adequate vent holes and perform a second burn. In this instance, it is recommended that a large quantity of fuel be spilled into the pit to insure that the cylinders are safe for handling when removed from the pit.

H. Cylinders Containing Gases and Liquids:

1. Cylinders to be drained, bled off or disposed of, fall into three (3) categories:

a. Those that have serviceable discharge valves and the cylinder can be returned.

b. Those that have defective discharge valves and the cylinder has to be destroyed.

c. Those that have to be destroyed regardless of the condition of the valve.

Category "A"

Attach an appropriately sized compatible pipe line, minimum of ten (10) feet long, to the discharge outlet.

If cylinder does not have to be pressurized, slowly open the control valve and allow the fumes to dissipate slowly. If the material is hypergolic or pyrophoric, regulate the flow so that the flame can be controlled. The plumbing, for some materials must be slowly passivated to prevent a reaction of the material with metal.

If cylinder is designed to be pressurized to extract the material contained therein, connect the GN2 line to the inlet opening and pressurize from 10 to 20 lbs., above the estimated vapor pressure but not more than 50 PSI at any time. Slowly open the discharge valve and control the flow.

When the cylinder is empty under forced pressure, allow a free flow of GN2 through the plumbing for a short time. Then reduce the pressure to about 5 PSI. Close the discharge valve before the pressurizing valve at the cylinder. This action will insure an inert atmosphere in the cylinder.

After disconnecting the gas and plumbing lines, identify the cylinder as "EMPTY" or "EMPTY and PURGED" as the case may be.

CATEGORY "B"

Place the cylinder in a remote location.

At about 150 feet distant, shoot a 30.06 armor-piercing bullet into the cylinder. If a pressure build-up is noted, fire as many bullets into the cylinder as necessary to prevent a rupture and/or an explosion.

CATEGORY "C"

As noted in Paragraph G.2 above.

IX. UNUSUAL CHEMICALS OR PROPELLANTS

When unusual chemicals or propellants are authorized for disposal, contact the ~~Fire~~ Lieutenant in charge of Inspections for special instructions.

X. DEMOLITION BOX

A. This box is used to supply electrical energy to solid propellant igniters as a means for igniting explosives, liquids or other materials.

B. The box contains 4-6 Volt dry batteries connected in series to develop 24 volts. It is equipped with:

1. A spring-loaded toggle switch in an OFF position. To activate the switch, it is necessary to depress the level. When pressure is released, the switch snaps back to the OFF position.

2. Electric wire at least 150 feet long with both ends bared for connections to the switch and igniter ends.

C. Prior to using the box, the continuity of the current must be tested through to the terminals that connect to the igniter.

D. To insure safety to the man connecting the igniter terminals, he must take the lead wire with him to the material to be burned. After connecting the igniter to the leads, he will unreel the wire to the ignition box, then connect to the toggle switch terminals.

E. If an igniter fails to fire, or ignition of the material is not evident wait 15 minutes before repeating the two (2) preceeding paragraphs.

ROCKETDYNE

INTER-OFFICE LETTERS ONLY

TO	R. Clark, Chairman Management Safety Committee	DEPARTMENT	571 Cano
FROM	D. J. Hatz	DEPARTMENT	596-162 SanSu
PHONE	5651	DATE	17 February 1961
SUBJECT	Activities Summary - Hazards Review Committee		

The second meeting of the subject committee convened on Wednesday, 1 February 1961 at 8:30 a.m. in the PFL Manager's Conference Room.

Members present:

J. B. Ficklen, III	General Offices Consultant
R. B. Gordon	Industrial Hygiene and Safety
D. J. Hatz	Engineering Test
E. T. Higgins	Industrial Hygiene and Safety
R. Madden	Industrial Security
E. Mease	Facilities Engineering
S. Miller	Industrial Engineering
B. Minnich	Research

Members absent:

R. Ahlert	Research
M. Blum	Research
D. J. Jolicoeur	Engineering Test
H. Weiss	Engineering Test

Discussion Summary

D. J. Hatz, Acting Chairman, proposed the forming of a Hazardous Material Surveillance Sub-Committee consisting of S. J. Miller (Chairman), J. Dain, E. Higgins and M. Blum to review and evaluate the safety problems associated with the procurement, storage, and disposal of hazardous propellants and chemicals. Recommendations developed by this subcommittee will be presented to the HRC for approval and subsequent follow through. One of the first tasks of this committee will be to develop adequate definitions for classifying relative degrees of hazards and to prepare listing of quantity, location and special problems with those hazardous materials presently located at Rocketdyne. This proposal was adopted.

D. Hatz commented on a request from Engineering Material Services Group for an evaluation by HRC of the anticipated activities at the Van Owen Research Chemistry Laboratories with reference to the storage, purchasing, transportation and disposal of laboratory chemicals. It was decided that S. Miller, as chairman of the Materials Surveillance Subcommittee, would meet with those

FORM E A.R.S. REV. 1-57

directly concerned with this problem to determine the current status and to initiate a coordinated effort to resolve those areas where further action is needed. The results of these efforts will be presented at the next HRC meeting by C. Miller.

J. Ficklen suggested that a visit to the Chemistry Laboratory storerooms at Cal Tech would be worthwhile since they have developed very workable and safe methods for the storage and handling of hazardous laboratory chemicals.

In connection with the HRC effort to establish adequate safety standards for present and future uses of hydrogen at PFL, E. Mease was requested to have the Facility Design Criteria Committee establish a recommended electrical code and quantity distance criteria for hydrogen facilities.

E. Higgins and R. Madden were asked to collect and evaluate the presently used handling procedures for hydrogen and develop a suggested safety procedures manual which would be for the mechanics and technicians in the field.

D. Hatz reported on the progress of the revisions to the Propellant Field Use Manual. The sections on NTO, Hydrazines, Pentaborane and Hydrogen should be ready shortly. Advanced copies will be distributed to HRC members in advance of the March meeting so that members will be prepared for comments on the new sections. The section on Fluorides will be out before April and the Final PFUM ready for distribution by mid-April.

E. Higgins reported on the status of the chemical disposal facility. Although the plans for an adequate facility were designed by D/583-24 in October, 1960 (Project 8000596), no funding has been authorized to start action on this vitally needed project. The HRC wholeheartily agreed that the present burn pit is grossly inadequate to serve as a hazardous material disposal facility, and that improvement of this facility is of first priority importance. The discussion brought forth the following comments: the present burn pit facility consists essentially of several pits bulldozed out of the ground and a fire hydrant. During the past 18 months the PFL Fire Department has had to dispose of 37,375 gallons of hydrazine, NTO, Pentaborane, CTF, and RP-1, as well as 2,755 pounds of TEA, Sodium, Fluorine, and other hazardous and flammable chemicals and materials, using these open pits with only makeshift provisions for personnel protection. It has only been the good common sense employed by the Fire Department people working at the pit that has prevented serious injuries from occurring from this operation.

J. Dain reported that the Air Force is not interested in establishing a central reclamation activity for propellants, and that the contractor must clear through the A. F. Property Administrator to do so on their own. It appears the need for large scale disposal will continue for some time.

It was concluded that the effort to obtain funding for the Hazards Material Disposal Facility should be renewed with full HRC backing and support. If necessary certain provisions such as lighting and complete chain link fencing could be eliminated at this time in order to reduce the estimated cost by about $7000 in order to gain approval for the essential personnel protection items. R. Madden, E. Higgins and S. Miller were appointed to develop a justification for the proposed disposal improvements and present the package to R. Lodge for his approval and subsequent presentation before the Management Safety Committee where it is hoped that the necessary funding can be authorized.

The following status reports are to be presented at the next HRC meeting:

1. Basic Requirements for Solid Propellant Permanent Bulk and Ready Storage at PFL - S. Miller.

2. Phase III of the SPA Project - S. Miller.

3. New Solid Propellant Proposals on Propellant Formulations Containing Nitroglycerin - B. Minnich.

The meeting was adjourned at 11:00 a.m.

The next meeting of the HRC will be Wednesday, 1 March 1961.

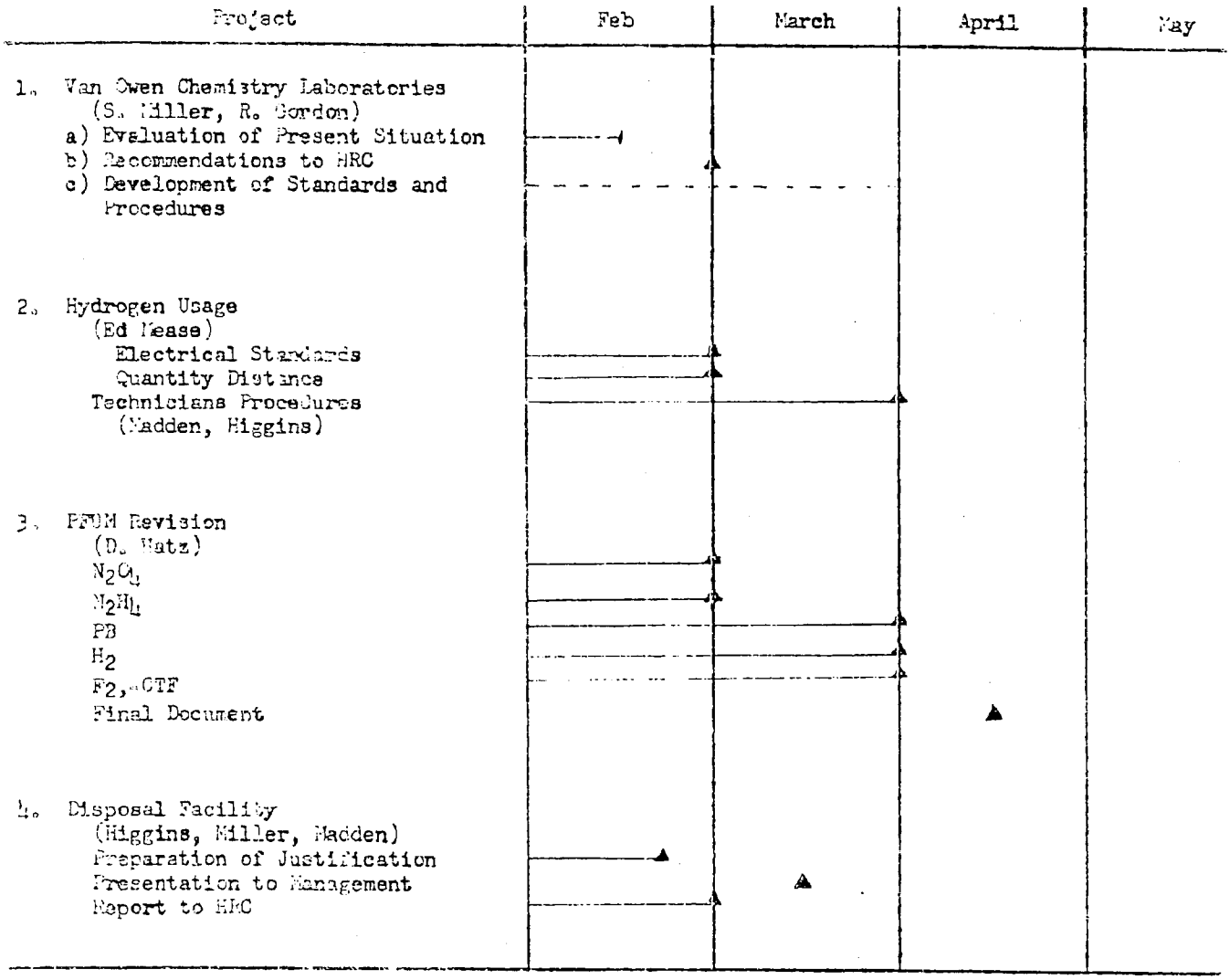
R. B. Gordon
Secretary

D. J. Hatz
Acting Chairman

DJH:RBG:rs

Distribution: Members, Management Safety Committee
Members, Hazards Review Committee
R. P. Dentner D/651 Neosho
R. T. Freedman D/651 G.O.
C. Scott D/551 Mc Gregor
R. Wilkins D/651 G.O. (2)

HRC Activity Time Schedule



ROCKETDYNE

INTER-OFFICE LETTERS ONLY

TO	R. Clark, Chairman Management Safety Committee	DEPARTMENT	571 Canoga
FROM	D. J. Jolicoeur	DEPARTMENT	596-162 SanSu
PHONE	5237	DATE	16 March 1961
SUBJECT	Activities Summary - Hazards Review Committee		

The third meeting of the subject committee convened on Wednesday, 1 March 1961, at 8:30 a.m. in the PFL Manager's Conference Room.

Members present:

J. E. Dain	Engineering Material Services
J. B. Pickles III	General Office Consultant
R. T. Gordon	Industrial Hygiene and Safety
E. T. Higgins	Industrial Hygiene and Safety
D. J. Jolicoeur	Engineering Test
E. R. Mease	Facilities Engineering
S. A. Miller	Industrial Engineering
C. E. Schoettlin, M. D.	Industrial Health Physician
R. L. Smith for J. W. Madden	Industrial Security
D. M. Minnich	Research
M. Weiss	Meteorologist

Guests present:

R. H. Rae	Industrial Engineering
J. E. Cain	Research

Members absent:

R. C. Ahlert	Research
M. C. Blum	Research
D. J. Katz	Engineering Test

Discussion Summary

Corrections to the minutes of the previous meeting were made as follows: the names of Dr. C. E. Schoettlin and J. E. Dain added to the members present list, and D. J. Madden added to the Hazardous Material Surveillance Sub-Committee membership.

The status of the Research Chemistry Laboratory relocation to the Vanowen Facility was reviewed by S. A. Miller. He reported that a meeting was held on 9 February 1961 with those directly concerned with possible safety considerations resulting from this move. From this meeting there did not appear to be any serious safety problems that needed to be resolved at this time, which could not be handled through normal research-support department coordination. R. H. Rae, the Industrial Engineer responsible for the relocation effort, was invited by S. A. Miller to explain the layout plans which were shown to the HRC. The locations of the various laboratories, storage facilities, and special facilities were indicated.

A visit to the Cal. Tech. Chemistry Laboratories by concerned Rocketdyne people is being arranged by S. A. Miller. This visit is for the purpose of observing methods used for storage and handling of hazardous chemicals which could be helpful in establishing safety procedures at Vanowen. This was originally suggested by J. B. Ficklin at the previous HRC meeting.

R. B. Gordon reported that G. Cianko of the Safety Section was working directly with R. F. Cain of Research in developing a listing of all hazardous chemicals to be used at Vanowen. This list would include the hazardous characteristics, the storage location, the container and labeling requirements, the chemist responsible for the material, and the maximum quantity limitations. This report will be distributed to those concerned by the Safety Office when completed.

In a discussion of possible problems associated with transferring extremely hazardous chemicals from shipping containers to laboratory apparatus, it was agreed that such operations be accomplished only in accordance with HRC approved procedures.

E. R. Mease reported on a visit to the Linde Air Production Plant in connection with the development of a lighter-than-air electrical standard. The draft for this hydrogen code was completed and distribution to HRC members for review was made subsequent to the meeting. Mr. Mease also commented on calculations made by the facility design group on blast potential from LH_2-LOX mixtures. These calculations indicated that from a quantity-distance standpoint, LH_2 does not appear any more hazardous than RP.

D. J. Jolicoeur reported that new PFUM revisions on CTF and pentaborane are nearly complete and will be distributed for comment soon.

On the subject of the chemical disposal facility, S. A. Miller proposed that a group be appointed to re-evaluate and redesign the original plans to develop a facility which could be built for about one-third of the original cost estimate. He felt that this would be the only possible way to get money approved for this project at this time. E. T. Higgins again emphasized the potential dangers involved with utilizing the present burn pits, and urged that facility improvements be accomplished by the most expeditous manner possible. S. Miller agreed that this would be done.

J. B. Ficklen commented on the possibility of using the city sewer at the Canoga plant for chemical disposal purposes. He stated that this had been successfully accomplished at other industrial plants where city permission had been granted. A list of presently accumulated, non-usable propellants which must be disposed was prepared by J. Main and given to R. B. Gordon who was delegated to determine feasibility of obtaining city approval for disposing these into the sewer.

S. A. Miller reported on the status of Phase III, Special Propellant Area (SPA). He stated that funding for this project is awaiting final approval from BOC as part of the Facility Appendix. This project will complete the SPA buildup program and will provide PFL with an acceptable storage area for hazardous propellants, thus providing a long sought for and needed capability.

A second status report was presented by S. A. Miller on ready storage magazines for explosives. A drawing of a proposed "magazette" was shown to the group. After a discussion of the safety consideration of such a project, the committee recommended some changes in the basic plan and requested that Industrial Engineering proceed with constructing a prototype model for trial purposes. Miller stated that this could be accomplished in four to six weeks.

In addition to the ready storage problem, there are now requirements for establishing bulk quantity limits for solid propellants, S. Miller reported. ROP H-505 establishes basic responsibilities but does not provide specific criteria. Miller stated that he would make some specific recommendation for correcting this situation at the next HRC meeting.

B. H. Minnich reported that at the present time, the future use of Nitroglycerin by the Solid Propellant Group was uncertain since proposals written are still under consideration. If more information is available by the next meeting, he will present it.

Dr. C. E. Schoettlin reported briefly on the new capability in animal toxicology research he has been developing in cooperation with the Industrial Hygiene Unit to meet various proposal requests from the Air Force. He also stated that the present medical surveillance program for propellant handlers would be given a thorough re-evaluation with revisions instituted as appropriate.

The next meeting will be held on Wednesday, 5 April 1961, at the usual time and location.

Tentative agenda for the April meeting:

Vanowen Research Chemistry Relocation	R. B. Gordon
Hydrogen Standards and Criteria	E. R. Mease
Hydrogen Usage Procedures	E. Higgins and R. Madden
PFUM Revisions - Review and Comment	D. J. Matz
Disposal Facility Re-evaluation	S. A. Miller
Chemical Disposal via Sewer Feasibility	R. B. Gordon
Quick-Mix Facility Status	S. A. Miller
Possible Beryllium Usage	D. J. Jolicoeur
Bulk Solid Propellant Criteria	S. A. Miller

R. B. Gordon
Secretary

DJJ:RBG:mb

D. J. Jolicoeur
Chairman

cc: Members, Management Safety Committee
Members, Hazards Review Committee
R. P. Dentner D/651 Neosho
R. T. Freedman D/851 G.O.
C. Scott D/551 McGregor
R. Wilkins D/851 G.O.
C. C. Cole D/851 G.O.
J. J. Malloy D/52 McGregor

Jolicoeur

COMPANY OFFICIAL
(NOT TO BE DISCLOSED TO UNAUTHORIZED PERSONS)

ROCKETDYNE

INTER-OFFICE LETTERS ONLY

TO	R. Clark, Chairman Management Safety Committee	DEPARTMENT	571 Zone 2
FROM	D. J. Hatz	DEPARTMENT	596-162 Zone 12
PHONE	5654	DATE	25 April 1961
SUBJECT	Activities Summary - Hazards Review Committee		

The fourth meeting of the subject committee convened on Wednesday, ~~1 March~~ 5 April 1961, at 8:30 a.m. in the PFL Manager's Conference Room.

Members Present:

M. M. Berman for H. C. Blum	Research - Liquid Propulsion Section
J. F. Dain	Engineering Material Services
J. B. Ficklen, III	General Offices Consultant
R. B. Gordon	Industrial Hygiene and Safety
D. J. Hatz	Engineering Test
R. J. Madden	Industrial Security
S. A. Miller	Industrial Engineering
C. F. Schoettlin, M.D.	Industrial Health Physician
H. Weiss	Meteorologist

Guest Present:

A. W. Miller	Fire Captain - Canoga

Members Absent:

R. C. Ahlert	Research - Propellant Engineering
E. T. Higgins	Industrial Hygiene and Safety
D. J. Jolicoeur	Engineering Test
E. R. Mease	Facilities Engineering
B. H. Minnich	Research - Solid Propellants

D. J. Hatz opened the meeting with a review of the potential blast hazard problems associated with a proposal program to static test fire the second stage Saturn vehicle at PFL. This vehicle would consist of a cluster of four J-2 engines. Gross propellant tankage of Liquid Hydrogen-Liquid Oxygen would amount to 360,000 pounds. Assuming a 15% TNT equivalent for these propellants, this would equal 54,000 pounds of high explosive potential. Rocketdyne management has imposed a maximum test area limit of 9000 pounds of high explosive potential at PFL. This limit means that the second stage Saturn static test would be limited to 30 seconds. The test requirements, however, call for 180 second duration runs. This problem is yet to be resolved, and points up the need for more definitive hydrogen blast criteria.

R. B. Gordon reported on the progress of the Vanowen Research Laboratory activation. The move from PFL has been nearly completed. Although the bulk of the chemicals were transported without incident, occasional small moves of hazardous items have created some administrative problems. To help correct this situation, the committee requested R. J. Madden to develop a procedure for controlling these moves at PFL. Subsequent to this, the Fire Department has established a certification program whereby any proposed move of a hazardous material from PFL to Canoga must have written authorization from the Fire Department.

Captain A. Miller of the Canoga Facility Fire Department presented several problems associated with the Vanowen activation to the attention of the HRC. These included a possible ventilation short-circuiting problem where air conditioning intakes could pick up toxic fumes from the exhaust ducts leading from the chemical hoods in the laboratories. This is presently being investigated with Industrial Engineering. A procedure has been developed by Capt. Miller to provide rapid shutdown of all intake units in the event of an accidental release of toxic vapors into the ventilation system in the Vanowen building.

R. J. Madden reported on the status of the Hydrogen Use Procedure he has been developing with E. T. Higgins. Numerous points were discussed such as the need of spark-proof tools, special personnel clothing, conductive shoes, etc. It was generally agreed that these points should be evaluated and definite standards established soon to avoid inconsistant safety practices in the various operations going into hydrogen usage.

D. J. Hatz stated that work was progressing on the revisions to the Propellant Field Use Manual and that review copies would be out soon.

R. B. Gordon reported on his investigation of the feasibility of disposing surplus propellants via the sewer at Canoga. It appears that the City of Los Angeles will allow disposal of these chemicals only if they are within a pH of 6 to 8. It was agreed that this requirement would prove impractical, and the HRC recommended that the Fire Department take necessary action to dispose of the surplus propellants by burning. J. Dain would initiate this action.

S. A. Miller discussed the progress on several projects his unit has been engaged in. The plans for improving the chemical disposal area has been revised so that the total cost is about one third that originally suggested. It was felt that this was the maximum expenditure which would be obtained at this time for this project. The HRC recommended that Industrial Engineering proceed with the revised plan. Also discussed was the various possible locations which could be used for a bulk storage location for solid propellant material. This problem needs further investigation before any recommendations can be made.

To: R. Clark
From: D. J. Hatz
Subject: Activities Summary - Hazards Review Committee

25 April 1961

The next meeting of the Hazards Review Committee will be held on Wednesday, 3 May 1961, at 8:30 a.m. in the Propulsion Field Laboratory Manager's Conference Room.

R. B. Gordon
Secretary

White Copy *

D. J. Hatz
Acting Chairman

DJH:RBG:mb

cc: Members, Management Safety Committee
Members, Hazards Review Committee
R. P. Dentner D/651 Neosho
R. T. Freedman D/851 G.O.
C. Scott D/551 McGregor
R. Wilkins D/851 G.O.
C. C. Cole D/851 G.O.
J. J. Malloy D/52 McGregor

ROCKETDYNE

INTER-OFFICE LETTERS ONLY

TO	R. Clark, Chairman Management Safety Committee	DEPARTMENT	571 Cano, Zone 2
FROM	D. J. Jolicoeur	DEPARTMENT	596-162 SanSu, Zone 12
PHONE	5654	DATE	9 May 1961
SUBJECT	Activities Summary - Hazards Review Committee		

The fifth meeting of the subject committee convened on Wednesday, 3 May 1961 at 8:30 A.M. in the PFL Manager's Conference Room.

Members Present:

R. C. Ahlert	Research - Propellant Engineering
M. C. Blum	Research - Liquid Propulsion Section
J. F. Dain	Engineering Material Services
J. B. Ficklen, III	General Offices Consultant
R. B. Gordon	Industrial Hygiene and Safety
D. J. Hatz	Engineering Test
E. T. Higgins	Industrial Hygiene and Safety
D. J. Jolicoeur	Engineering Test
R. J. Madden	Industrial Security
E. R. Mease	Facilities Engineering
S. A. Miller	Industrial Engineering
C. F. Schoettlin, M. D.	Industrial Health Physician
H. Weiss	Meteorologist

Members Absent:

B. H. Minnich	Research - Solid Propellants

D. J. Jolicoeur opened the meeting by reporting the results of the Corporate Office briefing on the Saturn second stage static testing proposal. He stated that concurrence with the HRC evaluation had been obtained for conducting the test program if S & I D is successful in getting the contract.

The status of the hydrogen electrical code was discussed. E. R. Mease will prepare advance copies of the proposed code as developed by the facilities engineering electrical subcommittee for distribution to HRC members for their review. The subcommittee chairman will be present at the next HRC meeting to resolve any comments and suggestions brought forth by HRC, and to obtain HRC approval on the completed code so that it can officially be put into use.

R. J. Madden reviewed for the committee the proposed Hydrogen Use Procedure that he, with E. T. Higgins, had prepared per HRC request. This procedure covers: personnel protection, tools and equipment, area construction, general

FORM F 4-E-S REV. 1-57

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area safety, liquid hydrogen transfer and fire protection. It was the feeling of the HRC that this first draft was an excellent effort toward meeting a real need at this time. Since several of the points suggested in this hydrogen use procedure are of a somewhat controversial nature, it was decided that ditto copies of this procedure would be reproduced and sent to each HRC member for thorough study and written comments so that adequate review coverage can be obtained prior to final adoption of this procedure by HRC. During this discussion it was concluded that hydrogen venting would not come under TOC control.

In view of the forthcoming expected extended use of hydrogen as a rocket fuel at PFL, D. J. Jolicoeur proposed that a single document combining all necessary procedures and codes on hydrogen usage be promulgated as rapidly as possible. It was agreed that the HRC chairman appoint a subcommittee for this task at once.

J. F. Dain requested that the list of surplus propellants that has been recommended for disposal by the HRC in the previous meeting be itemized in these minutes. These are as follows:

Propellant	Quantity
IRFNA (obsolete spec)	10 Drums
Hydrazine 75% - Ethanol 21% - H_2O 4%	40 Drums
UDMH 90% + 10% Water	16 Drums
Ethylene Diamine (drain back)	5 Drums
Hydrazine & H_2O (drain back)	6 Drums
UDMH & H_2O (drain back)	5 Drums
Mydyne (drain back)	1 Drum
Hydrazine 90% - EDA 10%	800 Gallons
Nitrogen Tetroxide (contaminated)	2000 Gallons

The subject of the Vanowen Chemical Laboratories was the next item of discussion. D. J. Jolicoeur asked if adequate coordination was evident in the establishment of safety controls. R. J. Madden reported that the Fire Department's newly established certification procedure for PFL-Canoga chemical moves was working out very satisfactory. It was agreed by HRC to delegate to the Fire Department the responsibility of effecting proper methods for transporting hazardous materials between facilities. The Fire Department will utilize the technical assistance and cooperation of the research chemistry unit, the engineering packaging unit, the safety department and transportation department in performing this duty.

S. A. Miller stated that he had been informed that all necessary cabinets and facilities for chemicals storage at Vanowen had been obtained or ordered. R. B. Gordon reported that the situation in regards to the ventilation system was being actively investigated. A joint effort of Industrial Engineering, Fire, Safety and Research representatives are collecting and evaluating all the pertinent facts to provide a realistic appraisal of the potential hazards

involved. A full report on this study should be ready for HRC review by the next meeting. Mr. Gordon further reported that the Industrial Hygiene unit was preparing a comprehensive reference chart which would summarize the hazardous properties, storage quantity limitations and safety procedures established for hazardous chemicals being utilized in the Vanowen laboratories. This chart should be ready for HRC review and approval at the next meeting.

R. C. Ahlert pointed out that new synthesized compounds developed in the Vanowen Labs will need periodic transporting to PFL for hazardous evaluation studies, and that methods suitable for handling materials of unknown properties must be available. It was agreed that R. J. Madden would work with Research on this problem as the HRC representative.

S. A. Miller reported on the status of Industrial Engineering programs of interest to HRC. The revised design for the chemical disposal burn pit modification and funding approval is scheduled for completion during May, with construction to be completed by the end of June. HRC members again emphasized that improvement of the burn pit situation is of first order priority, and that all steps necessary to have this accomplished should be taken as rapidly as possible. Miller stated that approval for construction of the first explosive storage "magazett" has been obtained, and that it would be built in the NAKA area. The Area I Solid Propellant Bulk Storage site has been selected, and its proposed location pointed out to the committee.

R. C. Ahlert requested that Material Services make a wider distribution of the propellant inventory in SPA to include research activities as this would be helpful for planning purposes and would stop possible duplication of propellant buys. J. F. Dain agreed to the proposed distribution.

C. F. Schoettlin commented on the medical surveillance program. He stated that a thorough evaluation was presently being conducted to eliminate any unnecessary work in this area, and that the best possible medical examination would be given those employees who may be potentially exposed to toxic materials.

The meeting was adjourned at 11:00 A.M., with the next meeting scheduled for Wednesday, June 6, 1961, at 8:30 A.M. in the Propulsion Field Laboratory Manager's Conference Room.

R. B. Gordon
Secretary

D. J. Jolicoeur
Chairman

RBG:DJJ:rs

IOL To: R. Clark, Chairman
Management Safety Committee
From: D. J. Jolicoeur
Subject: Activities Summary - Hazards Review Committee

Distribution: Members, Management Safety Committee
Members, Hazards Review Committee

R. P. Dentner	D/651 Neosho
R. T. Freedman	D/851 G.O.
C. Scott	D/51 McGregor
R. Wilkins	D/851 G.O.
C. C. Cole	D/851 G.O.
J. J. Malloy	D/52 McGregor

...ENTS CREATED BY VARIOUS PROPELLANTS AND CHEMICALS USED IN THE PROPULSION RESEARCH AREA (PRA)

	Open System Min. Security Max. Volume, gallons or pints	PROTECTIVE EQUIPMENT						Minimum Allowable Dist.-Hazardous Environment Bystander, feet	Local Use Pressure (Ref. 1) psig
		Respiratory	Face	Hands	Feet	Body	Head		
...Max Security		R-2	F-1	G-1	A-1	B-1	H-1	M - 25	
...Min Security	55 gal	R-1	F-1	G-1	A-1	B-1	H-1	M - 10	
...		R-1-S	F-1-S	G-1-S	A-1	B-1	H-1	M - 5	300
...Security		R-2	H-2	G-1	A-1	B-1 and B-2	H-2	M	
...Security	1 pt	R-1	F-1	G-1	A-1	B-1 and B-2-S	H-1	M - 30	
		R-2-S	H-2-S	G-1-S	A-1	B-1 and B-2-S	H-1 and H-2-S	M - 10	150
...Max Security		R-2	H-2	G-2	A-1	B-1 and B-2	H-2	P	
...Min Security	1/2 pt	H-2	H-2	G-2	A-1	B-1 and B-2	H-2	P	
...		R-2	H-2-S	G-2-S	A-1	B-1 and B-2-S	B-1 and H-2-S	P	50 (GF_2 Manifold 400)
...Max Security		R-2	H-2	G-2	A-1	B-1 and B-2	H-2	P	
...Min Security	0	R-2	H-2	G-2	A-1	B-1 and B-2	H-2	P	
...		R-2	H-2	G-2	A-1	B-1 and B-2	H-2	P	0
...Max Security		R-1	F-1	G-1	A-1	B-1	H-1	M - 15	
...Min Security	1 pt	R-1	F-1	G-1	A-1	B-1	H-1	M - 5	
...		R-1-S	F-1-S	G-1-S	A-1	B-1	H-1	M - 5	300
...Max & Min. Security	9000 gal	None	F-1	G-1	A-2	B-1	H-1	M - 5	
...		None	F-1-S	G-1-S	A-2	B-1	H-1	M - 5	300
...Max Security		R-2	H-2	G-1	A-1	B-1 and B-2	H-2	S	
...Min. Security	0	R-2	H-2	G-1	A-1	B-1 and B-2	H-2	S	
...		R-2	H-2	G-1	A-1	B-1 and B-2	H-2	S	100
...Max & Min. Security	500 gal	R-1	F-1	G-1	A-1	B-1	H-1	M - 25	
...		R-1	F-1	F-1	F-1	B-1	H-1	M - 25	300
...Max & Min Security		R-1	F-1	G-1	A-2	B-1	H-1	M - 10	
...Max & Min. Security	1 pt	R-1	F-1	G-1	A-1	B-1 and B-1	H-1	M - 15	
...		R-1-S	F-1-R	G-1-S	A-1	B-1 and B-1	H-1	M - 10	300
...Max & Min Security	55 gal	None	F-1	G-1	A-1	B-1 and B-1	H-1	M - 15	
...		None	F-1-S	G-1-S	A-1	B-1-S and B-1	H-1	M - 5	150
...Max & Min Security	55 gal	None	F-1	G-1	A-1	B-1 and B-5	H-1	M - 10	
...			F-1-S	G-1-S	A-1	B-1-S and B-5	H-1	M - 5	300
...Max Security			None	F-1	G-1	A-2	B-5	H-1	M - 10

	PROTECTIVE EQUIPMENT			
	Hands--Gloves	Feet	Body	Head
...rid	G-1 Polyet	A-1 Neoprene (Tingly)Boots	B-1 Flameproof Coveralls	B-1 Hardhat
Hood	G-2 Buna N Charee Ni Sol	A-2 Personal Work Shoes	B-2 Gralite Suit	B-2 Gralite Hood
...Soft Side	G-3 Hypergal		B-3 Raincoat, Long	
	G-4 Lubesine		B-4 Apron, Vinyl	
			B-5 Personal Work Clothes with long Sleeves or B-1	

...ion Operations - Maximum Security

...n a system wherein the amount [as stated in above table] of propellant exposed to the atmosphere is greater than that allowed by the ...rity defined in Definition 4, and vapors or liquid could be inhaled ...lete contact with, operating personnel. A few examples would be ...g transfer lines with propellants in them, connecting shipping ...rap tanks, dumping tanks or drums, and cleaning tool hardware with

...erations - Minimum Security

... are the same as Open System Operations-Maximum Security, except ...nt of propellant, liquid or vapor, is less than the amount defined ...tion operation, maximum security

...System Operations

...n a system in which the propellant or chemical is completely con...ith the propellant or chemical is flowing and under pressure less ...lowed by the Local Use Pressure (Ref. 1) and only a failure of the ...l cause operating personnel to be exposed. The local use pressure ...ure to which a system may be pressurized with people exposed to it ...ibria in Ref. 1

...ve Equipment

...Equipment which is actually worn by the conductor and is in ...to provide maximum protection for the operation in question; ...l denotes that respirator R-1 is installed on the conductor in ...position to provide maximum personnel protection.

...- Equipment which is in position within the perimeter of the area ...n a bystander is restricted and is to be worn by that personnel ...it on easily in case of emergency. R-1-S denotes that respirator R-1 ...e standby position

7. Minimum Allowable Distance of a Bystander from Hazardous Environment

M. Number of feet

S. Test pit area closed, bystanders allowed outside of test pit area

P. Propulsion Research Area closed, bystanders allowed in Control Center and Workshop with doors and windows closed

Q. Propulsion Research Area Closed, bystanders allowed in Control Center only

5. Pentaborane (Ref. 4).

DISCUSSION

It will be noted from the attached table that flameproof coveralls and neoprene boots are mandatory for all propellant operations and some chemical operations. There are several reasons; the coveralls are flameproofed, have long sleeves and long trouser legs, and minimize taking home contaminants; the boots protect the feet as well as minimize taking home contaminants.

This procedure obviously cannot cover all propellant and chemical use situations encountered in the day-to-day activities of PRA. Therefore, any items not covered will be the responsibility of the writer to resolve for maximum personnel protection.

Any comments concerning this procedure should be submitted to the author by AVG.

APPROVAL:

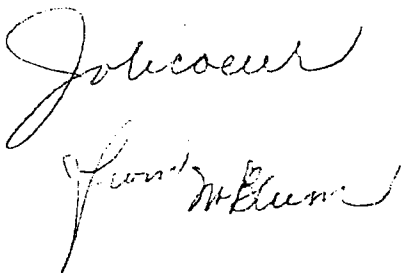
...Industrial Hygiene & Safety

Group Scientist

Senior Research Engineer
Liquid Propulsion Section
Research Department

Prepared by members of The Hazards Review Committee

JUNE 1961



ROCKETDYNE

INTER-OFFICE LETTERS ONLY

TO	A. C. COFFMAN	DEPARTMENT	597 -
FROM	O. C. LIDBETTER	DEPARTMENT	552 -
PHONE	2355	DATE	10 May 1961
SUBJECT	EXPLOSION, CHEMICAL DISPOSAL AREA - PFL; Report of		

INCIDENT -

At 2:50 P.M., Monday 8 May 1961, an explosion of apparent high order occurred in one of the burn pits at the chemical and fuel disposal area which scattered shrapnel, molten metal, mud and other debris over an area of approximately 1000 feet in all directions from the burn pit. The molten metal started numerous brush fires - three of which were well into the Cockrum property to the west. There were no injuries to the four personnel engaged in the disposal operation and no damage to capital or facility property. The fires were under control or extinguished at 3:05 P.M. Situation was secured at 3:1h P.M.

EVENTS -

A detail of events leading up to the foregoing incident is following. The Fire Department was authorized to dispose of 800 gallons of Nitrogen Tetroxide (NTO). The normal procedure for which has been to dump several hundred gallons of hydro-carbon fuels into the open pit which is ignited and allowed to burn freely for a short period of time before introducing the NTO. The NTO is introduced through piping of one inch in diameter from the NTO trailer tank with the trailer pump facilities delivering approximately 15GPM to the burning fuel.

This operation was set up under the direction of Lt. E. G. Addeo, Firemen J. Curican, E. Webb and R. Brecher. After ignition of the fuel and introduction of the NTO, the operation had continued normally for approximately thirty minutes at which time the explosion occurred.

Later, an examination of the burn pit in question revealed a crater of approximately 10'x8'x4' deep was formed as a result of the explosion. There appeared to have been approximately four cubic yards of dirt and debris blown out to a distance of approximately 150 feet from the crater

Shrapnel and burning metals were ejected to as much as 1000 feet, setting the fires.

This writer in company with Fire Lieutenants Addeo and Smith of D/552, R. J. Lodge and D. Jolicoeur of D/596, S. Miller of D/564 and E. Higgins of D/551 Safety visited the area on Wednesday morning, 9 May 1961 in an effort to determine the cause of the explosion and to evaluate the adequacy of the present disposal facilities.

Page 2
10 May 1961

To : A. G. Coffman
From : O. C. Ledbetter
Subject : Explosion, Chemical Disposal Area - PFL; Report of

No decisions were reached as to the exact cause of the explosion. It was assumed, however, that possibly NTO, being considerably heavier than the fuel, settled to the bottom where it was impregnated with the fuel forming a highly explosive mixture and that when the fuel burned down low enough to expose this mixture to ignition, the explosion occurred. It was definitely agreed that no further disposal of the more dangerous materials can take place until adequate facilities are provided.

S. Miller issued instructions to PFL Industrial Engineering to immediately review a proposal submitted by his group on 20 October 1960 and to come up with a revised proposal.

In the meantime, the Safety and Fire Departments have each placed a RED Tag on the existing facilities prohibiting further use until a safer facility has been provided.

Some idea of the importance of a disposal facility may be derived from the following:

From 1 July 1959 through April 1961, the Fire Department disposed of 40,865 gallons of miscellaneous liquics and chemicals, many of which were extremely dangerous. In addition, 2775 lbs. of solids were disposed of. The disposal operations over this period of time required 779 man hours from Fire Department Personnel.

It is this writer's opinion that it would be much cheaper and more to the Company's advantage to provide adequate disposal facilities than to attempt to haul this material away to some disposal concern.

O. C. Ledbetter

O. C. LEDBETTER
Fire Chief

OCL/vn

cc: R. J. Lodge, D/596
D. Jolicoeur, D/596
S. Miller, D/564
R. Higgins D/551 - Safety
A. A. Ameday, D/581
R. R. Henley, D/564
Lt. Addeo, D/552
File: R-31-1

ROCKETDYNE

INTER-OFFICE LETTERS ONLY

ET2-1-1164

TO: Those Listed — DEPARTMENT:

FROM: Hazards Review Committee — DEPARTMENT:

PHONE: 5238 — DATE: 18 May 1961

SUBJECT: CHEMICAL DISPOSAL OPERATIONS, PFL

During the past few weeks, attention focused on disposal operations has pointed out the need for reiteration of organizational responsibilities concerned with this operation. The following information has been mutually agreed upon by all concerned.

1. Overall Responsibility

Industrial Security, D/552, has overall responsibility for the operation of the disposal facility. Capt. Madden should be contacted for all questions regarding this operation.

2. General Facility Design

Industrial Engineering, D/564, is responsible for all engineering designs to be employed at the disposal facility. Mr. W. Wensel will act as the 564 representative.

3. Installation of Equipment

All effort at the disposal facility involving installation and modification will be the responsibility of D/564-546. If specialized problems arise, D/596-162 will assist 564 as required.

4. Technical Support

Dept. 596-162 will furnish technical support as required. As new methods for disposal are developed, inputs will be directed to D/552 for consideration. Mr. E. Suarez-Alfonso will be responsible for D/596-162 technical support.

5. Propellant Logistics

a. Dept. 596-305 will determine what propellants can be destroyed and aquire permission to do so from the AFPR.
b. The actual quantities to be disposed of or located at the disposal facility will be determined by D/596-305 and monitored by the HRC.
c. Dept. 596-305 will deliver propellants to the disposal facility and perform any propellant transfer operations necessary prior to disposal.

6. Disposal Operations

The disposal will be performed by Industrial Security. Technical

support for these operations will be furnished as required. TOC will be responsible for meteorological control of the disposal operation.

D. J. Jolicoeur
Chairman
Hazards Review Committee

DJJ:DJH:sd

dc: A. Akers 596-162 SanSu
R. Buckles 596-162 SanSu
J. Dain 596-305 SanSu
D. Hatz 596-162 SanSu
J. Hiegel 596-305 SanSu
R. Madden 552 SanSu
S. Miller 564-05 SanSu
E. Suarez-Alfonso 596-162 SanSu
H. Sutherland 596-162 SanSu
File ET2
File Subject

1. Purpose

1.1 To establish the minimum safety requirements for the disposal of chemicals, propellants, explosives, and/or other hazardous materials at the Propellant Disposal Area.

2. Area Operating Procedures:

2.1 Prior to disposal of hazardous material, an operating procedure shall be prepared by the group performing the disposal operation.

2.1.1 Protective Services personnel ~~manually~~ normally will perform the disposal operation. Disposal of scrap explosives, pyrotechnic and solid propellant waste will be accomplished by Research personnel with Protective Services providing the necessary fire standby.

2.1.2 Protective clothing requirements recommended by the disposal group and concurred in by Industrial Hygiene & Safety shall be included in the operating procedure (Protective Services Operating Procedure or Research SSOP).

2.1.3 Operating procedures shall be readily available to personnel conducting the disposal operation.

3. Notification:

3.1 Permission shall be obtained from Operations Surveillance (Meteorology) prior to the disposal of all toxic materials at the Chemical Disposal Area.

4. Area Warning System:

4.1 The area warning system shall be used during the disposal of all hazardous material at Chemical Disposal Area. This will be accomplished by placing either a manned roadblock or raising the red flag before the start of the disposal operation.

5. Storage of Hazardous Materials:

5.1 All hazardous materials shall be stored in the area designated for that material.

5.1.1 Adequate distances shall be maintained between incompatible materials.

6. General Safety Requirements

6.1 Employees shall conduct themselves in a safe and orderly manner while at the Chemical Disposal Area.

6.2 Only those employees required for a given disposal operation shall be present in the chemical disposal area.

6.2.1 A minimum of two employees shall be present for all disposal operations.

6.3 All tools and equipment used in the disposal activities shall be maintained in a safe condition and properly stored when not in use.

ROCKETDYNE

INTER-OFFICE LETTERS ONLY

TO	R. Clark, Chairman Management Safety Committee	DEPARTMENT	571 Canoga, Zone 2
FROM	D. J. Jolicoeur	DEPARTMENT	596-162 SanSu, Zone 12
PHONE	5654	DATE	13 July 1961
SUBJECT	Activities Summary - Hazards Review Committee		

The seventh meeting of the subject committee convened on Wednesday, 5 July 1961 at 8:30 A.M. in the Area II PFL Manager's Conference Room.

Members Present:

R. C. Ahlert	Research - Propellant Engineering
J. F. Dain	Engineering Material Services
J. B. Ficklen, III	General Offices Consultant
R. B. Gordon	Industrial Hygiene and Safety
D. J. Hatz	Engineering Test
E. T. Higgins	Industrial Hygiene and Safety
R. J. Madden	Industrial Security
S. A. Miller	Industrial Engineering
B. H. Minnich	Research - Solid Propellants
C. F. Schoettlin, M.D.	Industrial Health Physician
H. Weiss	Meteorologist

Members Absent:

M. C. Blum	Research - Liquid Propulsion Section
D. J. Jolicoeur	Engineering Test
E. R. Mease	Facilities Engineering

Guests Present:

E. F. Cain	Research - Chemistry, Vanowen
J. Silverman	Research - Chemistry, Vanowen
C. O. Malin	Engineering Development Laboratory
J. D. McClendon	Facilities Engineering

The meeting was opened with a report from J. Silverman and E. Cain of an incident which occurred in the Vanowen Chemistry Laboratories on Friday, 30 August 1961. A fire occurred in a beaker containing a boron hydride

compound in a chemical hood. The resulting smoke and vapors, which came out the hood exhaust, were picked up by several air conditioning intakes located downwind on the roof. This caused a strong, irritating odor to permeate throughout the section of the Vanowen building located next to the laboratories. Although the borane concentration in the building was not found to be significant from a toxic standpoint, a very disagreeable odor was present. When advised of the situation, the chemist conducting the experiment carried the burning beaker to an outside location where it was extinguished in a barrel of water.

The intakes were turned off by fire department personnel as per previously established emergency plans, but not until vapors had entered the office areas. As an immediate expediency, research chemistry personnel are being instructed on the locations of the fresh air intake fans, so that the time required for fire department action can be reduced.

Mr. Silverman felt that this experience clearly illustrated the need for corrective action in the ventilation system. The committee felt that elevated intake ducts would be preferable to modification of the exhaust ducting. The question of placing filters in the exhausts was also discussed. S. Miller and H. Weiss were asked to look into this matter more thoroughly.

The next item of discussion was a report by C. Malin on the safety aspects of the inert atmospheric brazing furnaces being installed in the Development Laboratories. The HRC made some helpful suggestions for improved safety features which could be incorporated in the system.

S. A. Miller, in commenting on the Solid Propellant Area Safety Modifications, stated that the complete package has been presented to Industrial Engineering Management where it has been awaiting final approval for the past twelve days. It was agreed that HRC would attempt to contact the appropriate people to insure that action is not delayed unnecessarily on this extremely critical project.

The increased hazard due to hydrogen testing in the Bowl area makes the occupancy of Bldg. 392, a wooden building used by Research for a flame study contract, very unsafe from a blast standpoint. J. McClendon reported that 9/10 of a psi shock wave could reach and seriously damage this building. A temporary barricade in front would not keep the roof from falling in.

From: D. J. Jolicoeur
Subject: Activities Summary - Hazards Review Committee

The HRC recommended that to save on the expense of constructing a reinforced concrete block house, a temporary sandbag barricade could be installed, providing the roof on building 392 is removed and replaced with canvas.

R. B. Gordon reported that the Beryllium Hazards Subcommittee had met and that a report of the results was being circulated around members for comments prior to distribution.

In the Round Robin Discussion, D. J. Hatz discussed the spill test progress at Edwards. R. J. Albert commented on the widespread interest hazard evaluation studies received in the Aerospace agencies. He also reported an incident involving handling of dangerous materials by Receiving.

It was reported that a demonstration run of the new Quick Mix facility in Happy Valley is scheduled for July 18. Fire and Safety personnel are reviewing the safety aspects of this operation.

The next meeting will be held Wednesday, 2 August 1961, at 8:30 A.M. in the Propulsion Field Laboratory Manager's Conference Room.

R. B. Gordon
Secretary

D. J. Jolicoeur
Chairman

RBG:DJJ:cb

ROCKETDYNE

INTER-OFFICE LETTERS ONLY

TO	R. Clark, Chairman Management Safety Committee	DEPARTMENT	571 Canoga, Zone 2
FROM	D. J. Jolicoeur	DEPARTMENT	596-162 SanSu, Zone 12
PHONE	5654	DATE	13 July 1961
SUBJECT	Activities Summary - Hazards Review Committee		

The seventh meeting of the subject committee convened on Wednesday, 5 July 1961 at 8:30 A.M. in the Area II PFL Manager's Conference Room.

Members Present:

R. C. Ahlert	Research - Propellant Engineering
J. F. Dain	Engineering Material Services
J. B. Ficklen, III	General Offices Consultant
R. B. Gordon	Industrial Hygiene and Safety
D. J. Hatz	Engineering Test
E. T. Higgins	Industrial Hygiene and Safety
R. J. Madden	Industrial Security
S. A. Miller	Industrial Engineering
B. H. Minnich	Research - Solid Propellants
C. F. Schoettlin, M.D.	Industrial Health Physician
H. Weiss	Meteorologist

Members Absent:

M. C. Blum	Research - Liquid Propulsion Section
D. J. Jolicoeur	Engineering Test
E. R. Mease	Facilities Engineering

Guests Present:

E. F. Cain	Research - Chemistry, Vanowen
J. Silverman	Research - Chemistry, Vanowen
C. O. Malin	Engineering Development Laboratory
J. D. McClendon	Facilities Engineering

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The next meeting will be held Wednesday, 2 August 1961, at 8:30 A.M. in the Propulsion Field Laboratory Manager's Conference Room.

R. B. Gordon
Secretary

D. J. Jolicoeur
Chairman

RBG:DJJ:cb

ROCKETDYNE

INTER-OFFICE LETTERS ONLY

TO	R. Clark, Chairman Management Safety Committee	DEPARTMENT	571 Cano, Zone 2
FROM	D. J. Jolicoeur	DEPARTMENT	596-162 SanSu, Zone 12
PHONE	5238	DATE	16 August 1961
SUBJECT	Activities Summary - Hazards Review Committee		

The eighth meeting of the subject committee convened on Wednesday, 2 August 1961, at 8:30 A. M. in the Area II PFL Manager's Conference Room.

Members Present:

R. C. Ahlert	Research - Propellant Engineering
W. Beel for J. F. Dain	Engineering Material Services
M. Berman for M. C. Blum	Research - Liquid Propulsion Section
R. B. Gordon	Industrial Hygiene and Safety
D. J. Hatz	Engineering Test
E. T. Higgins	Industrial Hygiene and Safety
D. J. Jolicoeur	Engineering Test
A. W. Miller for R. J. Madden	Industrial Security
S. A. Miller	Industrial Engineering
B. H. Minnich	Research - Solid Propellants
C. F. Schoettlin, M. D.	Industrial Health Physician
H. Weiss	Meteorologist

Members Absent:

J. B. Ficklen, III	General Offices Consultant

Guests Present:

E. G. Addeo	Industrial Security
G. S. Gill	Research - Liquid Propulsion
E. A. Lawton	Research - Chemical Synthesis

The first item of discussion was the forthcoming use of Oxygen Difloride (OF_2) by the Research Liquid Propulsion Group. Dr. Schoettlin reported on the preliminary data obtained from animal toxicological studies conducted by his unit. He stated that from the present incomplete information available, OF_2 should be considered as having toxicity hazards in the same degree as found with Pentaborane, i.e., extremely toxic. H. Weiss recommended that for the present time, operations should be restricted so that no more than 50 pounds of OF_2 could be accidently released at any one time. All hazardous operations should be conducted only under proper micrometeorological conditions. The HRC concurred with these recommendations. Research agreed to develop detailed operational procedures for handling OF_2 subject to

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special protective clothing for use with the newer high energy propellants. Several experimental fabrics have recently been developed for this purpose; these are at present being evaluated for suitability at Rocketdyne by R. B. Gordon. It is anticipated that two complete self-contained breathing and ventilation Gra-lite suits will be available for use within six weeks.

M. Berman reported on a projected small scale (300-400 lbs.) Pentaborane program in PRA, to begin in several weeks.

S. A. Miller agreed to provide a revised report on the bulk explosive storage status at the next HRC meeting.

The next meeting will be held on Wednesday, 6 September 1961, at 8:30 A. M. in the Propulsion Field Laboratory Manager's Conference Room.

R. B. Gordon
Secretary

D. J. Jolicoeur
Chairman

RBG:DJJ:sd

ROCKETDYNE

INTER-OFFICE LETTERS ONLY

TO	A. A. Ameday	DEPARTMENT	581 Zone 7
FROM	D. J. Jolicoeur	DEPARTMENT	596-162 Zone 12
PHONE	5238	DATE	21 August 1961
SUBJECT	PFL Burn Facility Improvement		

The Hazards Review Committee has caused a re-evaluation to be made of our requirements for a liquid propellant disposal facility. These requirements are reflected in a report which accompanies a job order being processed to you for your approval.

We feel that the recommendations are not excessive and that, in fact, the facility will probably be built for less cost than estimated. The drum handler and tilting and release mechanism can be built from scrap materials in the conservation yard at little or no cost.

Your prompt approval on this project is requested so that the improved facility can be activated to preclude the occurrence of the type of mishaps that have occurred with our present inadequate facilities.

D. J. Jolicoeur, Group Leader
Analysis and Equipment Group
Engineering Test

DJJ:mb

cc: R. Gordon
R. Lodge
Dr. Schoettlin

ROCKETDYNE

INTER-OFFICE LETTERS ONLY

TO	R. Clark Management Safety Committee	DEPARTMENT	571	Zone 2
FROM	D. J. Jolicoeur	DEPARTMENT	596-162	Zone 12
PHONE	5238	DATE	18 September 1961	

SUBJECT Activities Summary - Hazards Review Committee

The ninth meeting of the subject committee convened on Wednesday, 6 ~~August~~ Sept 1961, at 8:30 A.M. in the Area II Manager's Conference Room:

Members present:

M. C. Blum	Research - Liquid Propulsion Section
J. B. Ficklen III	General Offices Consultant
R. B. Gordon	Industrial Hygiene and Safety
D. J. Hatz	Engineering Test
J. Hiegel for J. F. Dain	Engineering Material Services
D. J. Jolicoeur	Engineering Test
R. J. Madden	Industrial Security
C. E. Schoettlin	Industrial Health Physician
D. S. Venning for S.A. Miller	Industrial Engineering
E. S. Vorrath for E. Mease	Facilities Engineering
H. Weiss	Meteorologist

Members absent:

R. C. Ahlert	Research - Propellant Engineering
E. T. Higgins	Industrial Hygiene and Safety
B. H. Minnich	Research - Solid Propellants

Chairman Jolicoeur led off the discussion with a review of various incidents and activities which have occurred since the last meeting which are of concern to the HRC:

1. Shrapnel in CTL-IV - Several pieces of metal landed in the CTL-IV area when the Explosive Forming Unit attempted to break up a large chunk of Kirksite by the use of explosive charges. Even though the explosion took place under three feet of water, several Kirksite pieces weighing up to several pounds was propelled some 400 feet, to within 20 feet of a liquid hydrogen test stand. Upon investigation by the Safety Department, it was agreed that explosive breaking of Kirksite would cease immediately, and that a public address tie-in would be made between Explosive Forming and CTL-IV so that mutual exchange of operational warnings could in instituted. This incident again illustrates the hazards which may result when non-standard activities are conducted without proper review.

2. CF_2 - Several shipments of CF2 cylinders have arrived at PFL. These are being stored in a special location in the Special Propellant Area. A method has been worked out jointly between Fire, Health and Safety, Receiving, Material Services and Research for the safe receiving and storage of these cylinders. Several discrepancies on the part of the vendor in properly preparing these cylinders for shipping has been reported through channels to the vendor for correction.

3. Asphixiation Incidents - A fatality occurred recently at Vandenburg AFB when a worker descended into a LOX pit which had become saturated with nitrogen vapors. D. J. Jolicoeur reported that survey of facilities at PFL had been undertaken to identify any possible location which could create a similar problem.

4. Hydrogen Safety - A briefing chart showing the current status of developing hydrogen safety procedures at PFL prepared for Management was shown to the committee by D. J. Jolicoeur. The chart outlined the various phases of the problem and the action being taken. Items requiring further study included personnel protection. A discussion on this area followed. A report prepared by T. Spring, D/596-162, on this subject was distributed to HRC members for their comments. A program to evaluate effectiveness of various clothing material and safety gear for hydrogen flash-over fires is being undertaken as a joint D/596-162-Safety Section project. A report prepared by the Program Analysis Unit entitled "Liquid and Gaseous Hydrogen Handling Manual", (R-3156) has been published as a guide for PFL activities. This report was reviewed by HRC.

M. C. Blum inquired about the status of the Hydrogen Electrical Code. It was indicated by the Chairman that this report has been finalized by Facilities Engineering but apparently has not been published as yet.

5. Vanguard Building Ventilation - The Chairman reported that action to modify the intake ducts to prevent possible contamination from the chemical hood exhaust fumes is being taken in accordance with previous HRC recommendations.

6. Disposal Facility - The design for modifying the disposal area at PFL has been completed and all approvals have been obtained. It is expected that actual work on the project will commence shortly.

7. Safety Promotion - The Chairman presented a suggested replacement for the present Satelite Safety sign. It was agreed that the present sign has lost most of its effectiveness and that a new approach is indicated. The

suggested plan was to establish a safety image of a cartoon nature which would be used with various safety slogans. The Chairman submitted the example sign model to C. E. Schoettlin for necessary followup action through Rocketdyne and N.A.A. Safety Section channels.

In the general discussion period, M. C. Blum reported that a new pentaborane program was scheduled for PRA in the near future.

The next HRC meeting will be held on Wednesday, 4 October 1961 at the usual time and place.

R. B. Gordon
Secretary

D. J. Jolicoeur
Chairman

RBG:DJJ:cb

ROCKETDYNE

INTER-OFFICE LETTERS ONLY

TO	R. Clark	DEPARTMENT	571 Cano Zone 2
FROM	D. J. Jolicoeur	DEPARTMENT	551 Cano Zone 1
PHONE	2273	DATE	10 October 1961
SUBJECT	Activities Summary - Hazard Review Committee		

The tenth meeting of the subject committee convened on Wednesday, 4 October 1961, at 8:30 A.M. in Conference Room 4, PPL.

Members present:

W. Beal for J. F. Dain	Engineering Material Services
M. C. Blum	Research - Liquid Propulsion
G. Cianko for C. E. Schoettlin	Medical
J. B. Ficklen, III	General Offices Consultant
R. B. Gordon	Industrial Hygiene and Safety
D. J. Hatz	Engineering Test
D. J. Jolicoeur	Chief Safety Engineer
R. J. Madden	Industrial Security
E. R. Mease	Facilities Engineering
S. A. Miller	Industrial Engineering
B. Minnich	Research - Solid Propellants
H. Weiss	Meteorologist

Members absent:

R. C. Ahlert	Research - Propellant Engineering

Guests present:

M. Berman	Research - Liquid Propulsion
J. Rosas	Industrial Hygiene and Safety

1. The disposal facility project was the first item discussed. R. Madden was requested to determine the schedule for this project. He proposed that the design phase will be completed October 15th. Check prints will be out for approval on October 18th, bids are to be out by October 25th, and construction should begin on or about November 15th.

2. A briefing on a pentaborane/hydrazine test program to be conducted by Research was presented by M. Berman and M. C. Blum. The safety preparations for this program were reviewed. It was the feeling of the HRC that the efforts of the Liquid Propulsion Section of Research in preparing for this project was an excellent example of proper design and operational integrity gained from thorough preplanning.

FORM R-[illegible]

3. The preparations for dealing effectively with the growing hydrogen culture at PFL were discussed. D. J. Jolicoeur reported that a subcommittee is working on reviewing the Parson's Report in terms of hydrogen hazards.

E. R. Mease passed out to the committee members review copies of the proposed Electrical Installation Standards for Hydrogen. Written comments on this document are to be returned to the HRC Secretary by all members. It was hoped that any difficulties could be worked out prior to the next meeting so that formal HRC acceptance can be placed on this standard at the November HRC meeting.

4. Oxygen Difluoride was the next item discussed. Specific handling and operating procedures are in the process of being developed by M. C. Blum with assistance from appropriate support functions for PRA operation. Blum will also coordinate with other Research groups planning to use OF_2.

G. M. Cianko stated that additional copies of his report on the OF_2 toxicological investigation will be made available shortly. He further stated that he would welcome any suggestions regarding new chemicals that should be studied for toxicological information.

5. J. B. Ficklen reported on the meeting he attended recently at the State Division of Industrial Safety, which pertained to beryllium hazards. He feels that a reasonable approach will be taken by official enforcement agencies in establishing beryllium control standards.

R. B. Gordon
Secretary

D. J. Jolicoeur
Chairman

RBG:DJJ:rs

A REVIEW OF H. HODGE'S WORK AT THE UNIVERSITY OF ROCHESTER

In contrast to our study, Dr. Hodge exposed his animals (mice, rats, guinea pigs and rabbits) to OF_2 for 14 hours, divided into two daily 7-hour periods. He employed a fairly elaborate exposure chamber having a capacity of 25 cu.ft. His study was dynamic and the gas was continually generated throughout the time of exposure. The chamber also contained a monitoring system. He began his exposure work with 10 ppm and concluded it at the 0.1 ppm level. Records were kept on weight, blood chemistry, urine chemistry and micropathology.

Results of Pilot Study I at 10 ppm

Mice	Rats	Guinea Pigs	Rabbits
1.0 hr - 7%	1.0 hr - 8%	1.0 hr - 15%	1.0 hr - 0
2.5 hrs - 100%	1.5 hrs - 100%	2.5 hrs - 100%	4.5 hrs - 100%

Results of Pilot Study II at 5 ppm

Mice	Rats	Guinea Pigs	Rabbits
3.5 hrs - 10%	1.0 hr - 4%	3.0 hrs - 20%	5.0 hrs - 13%
7.0 hrs - 100%	4.5 hrs - 100%	5.0 hrs - 100%	7.0 hrs - 100%

Results of Pilot Study III at 1 ppm

Mice	Rats
7 hrs - 5%	15 hrs - 10%
31 Hrs - 100%	45 hrs - 100%

Results of Pilot Study IV at 0.5 ppm

Mice	Mice	Rats
15.5 hrs - 5%	31.75 hrs - 10%	52.00 hrs - 30%
77.0 hrs - 100%	70.50 hrs - 100%	5 weeks - 80%

RESULTS

Mortality -- No deaths occurred that could be related to the treatment.

Change in Body Weight - No consistent loss in weight noted.

Pathology -- Study of the lung, liver, kidney, thyroid and gonads revealed no consistent significant histological changes in this series.

Urine and Blood Analysis - The values for the exposed animals do not differ significantly from the control animal.

Hematological Findings - Slight changes noted only in the rabbits.

Conclusions - The variables studied would indicate that none of the exposed animals were injured by daily exposure to OF_2 at .1 ppm by volume. Growth rate, blood chemistry, urine chemistry and hematology all remained normal throught the experiment and no evidence of pathological change attributable to the exposure could be detected.

D.S. Venning
D/564

H. Weiss
596-160 5147

Burn-Pit Operations 30 August 1962

The meteorological restrictions placed upon propellant disposal operations apply primarily to toxic materials. In essence, this means that:

1. Toxic propellants are burned only during normal afternoon wind conditions (wind from W or NW) or during Santa Ana conditions (wind from N or NE).

2. Solid propellant wastes are burned at any time when the wind is not blowing directly toward CTL V.

3. Hydrocarbons and generally non-toxic materials are burned at any time.

We have had some difficulty recently in trying to burn on first shift even under the so-called favorable W or NW wind conditions. This is due to the presence of many contractors in the south portion of CTL III, a location which is just barely in the path of the effluent cloud from the burn pit. To prevent contractor disturbances or down-time, we have requested that the Fire Department wait until the contractors have left before conducting toxic propellant disposal operations.

At no time did we change the wind direction criteria (the wind must still blow from the W or NW to protect the rest of P[redacted]). Therefore, any request for night lighting at the burn-pit must be considered invalid due to the fact that wind directions (and speeds) are not favorable for these operations at night.

With the approach of fall and winter and the gradual decrease in the number of daylight hours available, we must conclude that for propellant disposal operations to be conducted safely, we will be obliged to inconvenience the contractors slightly rather than operate at night.

H. Weiss
Meteorologist-in-Charge
Test Operations & Recording Center

cc: E.G. Addeo D/552

HW:lm

IOL to D. J. Jolicoeur

From G. M. Cianko

SUBJECT ACTIVITY SUMMARY HRC

The 13th meeting of the subject committee convened on Wednesday, 3 January 1962 at 8:30 A.M. in the Labor Relations Conference Room, Canoga Park.

Members present: RCA
WRB
MCH
GMC
DJH
DJJ
RJM
SAM
CAM
CES
HW —

Members absent: EM

Chairman Jolicoeur opened the meeting by introducing Mr. Charles Mitchell from Human Factor Section to other members.

The Chairman recapped several orders of business covered in the past month:

1. The inspection of the Bowl Area by the Safety Department showed that there were 68 violations noted.
2. The problem of the procurement of toxic materials was handled by an emergency session of the sub-committee who detailed new emergency procedures for the procurement of toxic materials and a suggestion that the ROP H521 and H521.1 should come under close scrutiny for revision. The emergency procedures were turned over to Chief O. C. Ledbetter.
3. All the committees at Rocketdyne are now under the scrutiny of Mr. Gallant; this includes the HRC Committee. It is hoped that these committees will be re-vamped for greater efficiency.

The Chief Safety Engineer discussed the accident trends for the members. Several interesting facts were noted:

a. Older employees are apt to have as many accidents as the newer ones.

b. The yearly cost for compensation for Rocketdyne has risen from $10,000 to our present status of $100,000.

c. The injury distribution - backaches are the most frequent injuries seen so far, and this is far ahead of any of the other type injuries.

d. Apparently from all indications the NRC has done a good job because there have been no toxicity exposure cases added to this list. This data is very interesting to Safety and the Medical Department and it will be followed up with further investigation on data reduction cards.

e. The Safety Committee meetings now have first line supervisors attending them for the purpose of educating some of our newly appointed supervisors.

f. Mr. Don Hatz reported to the committee that seven new propellant handling manuals were recently prepared by the Analysis & Equipment Group for the Air Force. These are now available to certain people at Rocketdyne.

g. The MacGregor people are now in the process of manufacturing and firing grains made with beryllium. No problem is anticipated.

Disposal Area:

Mr. Miller discussed plans for building a 1500 sq.ft. concrete shelter containing a concrete pad with tilt tables and ditches for the disposal of some of our liquid propellant waste. Bids were sent out just before the meeting and it is hoped that it will be completed by March of this year. The area will not have any electrical power; plans are being drawn to run the facility by battery-driven power.

Electrical Standards:

The electrical standards have not been completed. One more attempt will be made to complete it before this is turned over to Mr. Lodge.

ROCKETDYNE

INTER-OFFICE LETTERS ONLY

TO	T. V. Carpenter	DEPARTMENT	564 - Zone 12
FROM	S. A. Miller	DEPARTMENT	582 - Zone 1
PHONE	1084	DATE	3 January 1962
SUBJECT	Proposed Liquid Disposal Facility		

The present concept of the proposed facility was reviewed by the Hazard Review Committee this date.

The dual hydraulic tilt system with concrete protective wall, wash pad and blacktop apron have the complete endorsement of the committee.

Assuming Capital funding, in the $4,000 to $6,000 range, is still on the 1962 forecast, adequate effort should be maintained to realize completion of this facility by early Spring 1962 since the backlog of existing chemicals to be burned continues to be high.

S. A. Miller
Supervisor
Facilities Planning

SAM:pmm

cc: D. J. Jolissaint, D/551 - Zone 1
R. J. Madden, D/552 - Zone 12
D. S. Venning, D/564 - Zone 12

FORM R 8-R-8

COMPANY OFFICIAL --
NOT TO BE DISCLOSED
TO UNAUTHORIZED PERSONNEL

ROCKETDYNE

INTER-OFFICE LETTERS ONLY

TO	R. Clark	DEPARTMENT	D/581 Cano Zone 2
FROM	D. J. Jolicoeur	DEPARTMENT	D/551 Cano Zone 1
PHONE	2273	DATE	30 January 1962
SUBJECT	Activities Summary - Hazards Review Committee		

The thirteenth meeting of the subject committee convened on Wednesday, 3 January 1962, at 8:30 a.m. in the Labor Relations Conference Room, Canoga Park.

Members present:

E. F. Cain	Research - Propellant Engineering
W. R. Beal	Engineering Material Services
M. C. Blum	Research - Liquid Propulsion
G. M. Cianko	Medical
D. J. Hatz	Engineering Test
D. J. Jolicoeur	Industrial Hygiene & Safety
R. J. Madden	Industrial Security
S. A. Miller	Facilities Engineering
B. H. Minnich	Research - Solid Propulsion
C. A. Mitchell	Reliability Analysis
C. E. Schoettlin, M. D.	Medical Director
H. Weiss	Engineering - Meteorologist

Members absent:

E. Mease	Facilities Engineering

Discussion

1. Mr. Charles A. Mitchell, Human Factors Section, was introduced to the Committee as a new member.

2. The problem of the administration of the procurement of hazardous materials has been handled in subcommittee. Emergency procedures for procurement have been developed and released pending possible revisions to ROP H 521 and H 521.1.

3. The chairman presented a briefing on accident trends at Rocketdyne, which prompted discussions on areas in which the Hazard Review Committee can be instrumental in accident prevention. Of particular interest was the statistic that no toxic exposures occurred during 1961.

4. Don Hatz submitted for H. R. C. scrutiny and approval an eight volume set of Propellant Design and Handling manuals recently developed for the Air Force. In that these manuals are intended as Rocketdyne standards, H. R. C. approval will be requested at the February meeting.

5. Sid Miller presented for approval plans for the hazardous liquids disposal area. The plans were discussed in detail and the approval given by H. R. C.

6. The chairman reported on the latest efforts to write an electrical standard for Lighter-Than-Air. It has been resolved that no electrical standard will be written at Rocketdyne; that the applicable codes are sufficient and that the area of conflict involves merely identifying the structures as to ventilated environments and confined environments. This practice is now being followed as evidenced by the recent memorandum on VTS-1. It is intended to make a determination for each structure as the problem arises.

The fourteenth meeting of the Committee will be held on Wednesday, 7 February 1962, at 8:30 a.m. in the Labor Relations Conference Room, Canoga Park.

G M Cianko

G. M. Cianko
Secretary

D. J. Jolicoeur
Chairman

DJJ:ds

ROCKETDYNE

INTER-OFFICE LETTERS ONLY

TO	Fire Personnel	DEPARTMENT	552 - PFL
FROM	Lieutenant E. G. Addeo	DEPARTMENT	552 - PFL
PHONE	5520	DATE	9 October 1962
SUBJECT	CHEMICAL DISPOSAL AREA - INSTRUCTIONS AND SAFE OPERATING PROCEDURE		

PURPOSE: (A) To establish a safe operating procedure at the Chemical Disposal Area prior to, during and following chemical disposal operations.

(B) Maintenance of good housekeeping practices.

A. GENERAL DESCRIPTION AND USES

The area is designed to safely dispose of waste propellants, chemicals and explosives. The principle safety feature of the area is the concrete "Block House" in which controls for remote drum tilting and ignition are located.

There are three (3) main disposal pits. Each pit is to be used to contain only special propellants or chemicals to prevent the possibility of generating dangerous explosive or hypergolic mixtures of incompatible materials.

Other equipment in the area includes a 1½" fire hose and reel, safety shower, signal flags and telephones direct to Test Operations Recording Center (T.O.R.C.) and to the Industrial Security Control Center, a GH2 Cylinder and Regulator for disposing of liquid and gaseous toxic and pyrophoric material in cylinders and other vessels.

B. DISPOSAL PITS - USES

The three (3) main disposal pits are used to receive and/or burn the following general materials. They are described numerically from left to right as the operator faces them through the Block House Observation Window.

Pit #1 -

Hydrazine and the various admixtures, such as UDMH, Hydyne, Monomethyl Hydrazine, Hydyne, Hydrazine with Alcohol, etc,

FORM R 6-R-5 REV. 1-57

Pit #2 -

Conventional fuels and liquids, such as Jet Fuels, Gasoline, Alcohol, Heptane, Paint Thinners, Lubricating and Hydraulic Oils, Rosins, Trichloroethylene, Solvents, solutions containing Pentaborane and similar materials.

Pit #3 -

Liquid oxidizer propellants, such as N.T.O., Irfna, Nitric Acid and similar materials.

WARNING: Ammonium Perchlorate, Ammonium Nitrate, Potassium Perchlorate, etc., in solid form or in solution are not to be placed in any of the above three (3) pits.

Miscellaneous Pits -

There are several other scooped-out holes in the area or trays where solid oxidizers, solid fuels and miscellaneous chemicals are disposed of.

C. PLACING DELIVERED DISPOSABLE MATERIAL

1. Place material in appropriate posted location.

2. If it is not known where particular materials are to be placed, contact the Shift Commander for instructions.

3. In all instances, the Inspection Section will be notified by an AVO as to what was placed in the area when they are not on duty.

D. DISPOSAL SAFETY REGULATIONS

Contact T.O.R.C. for clearance to conduct disposals, stating the type of materials.

At least two (2) men must be present during preparation and burning operations at all times.

1. Preparation -

A. Check fire hose.

B. Test safety shower.

C. Check safety clothing and safety equipment.

D. Visually check condition of the pit to be used.

E. Test the operation of the drum tilter, chains, etc.

F. Check the fuel ignition system.

G. Test the fixed water spray nozzles, adjust same if necessary.

H. Water spray blacktop for maximum static grounding.

I. Check necessary tools and equipment to be used.

J. Check communications (T.O.R.C. and Emergency Telephones).

K. Notify "Trouble Desk" if repairs are necessary.

2. Disposal and Burning -

A. Exercise safety in handling drums and spilling, wear proper safety equipment.

B. Practice the "Buddy System" at all times, especially during hazardous operations.

C. Notify T.O.R.C. and the Industrial Security Control Center approximately five (5) minutes prior to igniting fuels or disposing of chemicals.

D. Raise the area red signal flag.

E. Remain behind the Block House when spilling and during the burn.

F. Remove empty drums immediately to a safe area.

G. Maintain the work area clear of incumbrances to prevent injury.

H. Observe smoke and vapor conditions, and note any change of wind direction.

If smoke or toxic vapors drift toward CTL III or V, immediately notify T.O.R.C.

I. Observe for any other unusual conditions.

E. SECURING THE AREA

1. Close all fuel supply valves on the ignition systems.
2. Lower red flag and display the yellow flag when safe to do so.
3. Restore all tools, equipment, fire hose, etc., in proper location, clean and ready for use.
4. Notify T.O.R.C. that the disposal operation has been completed.
5. Place empty drums or pallets ready for pick-up.
6. Clean up the area. Filled trash cans are to be placed outside of the cable gate.
7. Secure cable gate when leaving.
8. Report defective safety equipment, tools, etc., in need of repair or replacement.

E. G. ADDEO
Fire Lieutenant
Inspections
P.F.L.

EGA:ml

dc: Police and Fire Supervision, PFL
H. Weiss, D/596, TDRC, PFL
File: R-31-17
W. A. Forrier, D/551, Cano

To: Chief O.C. Leibetter 10 February 1965
From: [illegible]
Subject: Fire Department Chemical Disposal Area, Area I, SSFL

During the past winter, work of construction of the new disposal pits at the Fire Department Chemical Disposal area, quantities of contaminated propellants, retrieved for disposal by fire personnel, had accumulated. These propellants are stored at the Chemical Disposal area and the Solid Propellant area (SPA), area 2.

These disposable propellants being held in the Flammable Liquid area due to lack of drum space in the Chemical Disposal area, are there in variance with Air Force Storage Regulations.

It should be further noted that drum lots of contaminated propellants at both SPA and the Chemical Disposal area are not under protection from the

weather nor have fire water protection. Continuous exposure to the elements has increased the storage and handling hazards of the chemicals.

Department 059-GFP and SSFL Test Area are constantly requesting return of emptied needed drums. Due to the inability of utilizing the Disposal Area these requests are not fullfilled. Dept 059-GFP has notified this office that the 203 returnable Hydrazine shipping drums being held pending disposal of their contents have each a 100 dollar demurage charge totaling $20,300. Gov. outlay. Further, the shortage of these drums has caused a vendor delay in the shipping Hydrazines.

Due to the extra hazards involved in handling these propellants during disposal operations it is the opinion of this office that this be maintained primarily a first shift operation.

The hazardous properties of the hydrazines and acids are well known, yet, the contamination and long storage terms increase the disposal problems.

Disposal operations require diligence and rigid safety methods.

Night time disposal operations would create unsafe conditions. Poor visibility with inadequate lighting would make it difficult to detect toxic vapors, adverse wind conditions or safe drum handling. Co-ordination with Operations Control would not be possible.

It has been suggested that disposal or abrasive operations of toxic materials such as the hydrazines or acids be conducted during periods of low employee population such as Company holidays or weekends. This would tend to minimize toxic vapor problems to nearby test areas and to maintain the minimum Fire Department coverage for ashore disposal conditions.

Listed below is an accounting of the accumulated associate listings for disposal by fire department personal at the chemical disposal area.

Hydrazine Types: Daytime Disposal and Burning

SPA Trailer	450 gals.
Returnable Drums	203 Drums
Warehouse Drums	29 drums
Non-returnable	33 drums
Total Drums	265
Total Gals. Trailer	450

Estimated Disposal Time: Drums 225 hrs.
(10 Drums/hr.)
Trailer 8½ hrs.
Total hrs. 233½ hrs.

Acids Daytime Disposal and Burning. Gallons

IRFNA	29 drums	NTO SPA Trailer	400 gal.
NTO	32 drums	NTO Cylinders	40 gal.
HCL	2 drums	Total gal.	440
MURIATIC	9 drums		
Total drums	72		

Estimated Dispsal Time Drums 76½ hrs.
Gallons 8½ hrs.
Total hrs. 85 hrs.

Hydrocarbons — Daylight Disposal - Night Burning

Warehouse Drums	66 drums
Nonreturnable Drums	191 drums
Total drums	257

Bulk Storage "SPA" - AF-1 — 20,000 gal.

Disposal Time: Normal work hrs.

IE-3-0175

INTERNAL LETTER
North American Aviation, Inc.

Date 7 October 1966

TO Lt. A. L. DiSepio
Address 052 Z-12

FROM C. C. Stough
Address 022 Z-12

Phone 5285

Subject Chemical Disposal Area - Acid Pit Dam

(a) IL A. L. DiSepio to D. S. Venning dated 16 September 1966, same subject.

In response to your letter of request for support (Reference a) Mr. J. T. Carter D/022 Industrial Engineering, made an inspection of the acid pit dam on 19 September 1966. He reported that the seepage at the toe of the south slope of the dam is probably due to some pervious material in the fill or insufficient compaction of soil when the dam was built.

This inspection validated the existence of this problem, but did not reveal it as imminently hazardous.

It is recommended that the use of the pit be continued, and if wet spots begin to show on the downstream face of dam, immediate action to correct the seepage will be taken. In the meantime action has been started to secure the necessary funds. Rehabilitation of the dam will be started when funds are approved.

Your constant vigilance in this area is appreciated and D/022 will welcome any further communication on this matter.

Carl C. Stough

C. C. Stough
Industrial Engineering

Approved:
D. S. Venning, Supervisor
Industrial Engineering

dc: D. C. Nelson Dc. D/022 Z-12

CCS:ar

O.S. 67-49

INTERNAL LETTER
North American Aviation, Inc.

Date 11 October 1967

TO R. J. Lodge
Address 096-200 Zone 12
Rocketdyne, SSFL

FROM Operations Surveillance
Address 096-200 Zone 12
Rocketdyne, SSFL

Phone

Subject **Materials Compatibility Tests with Freon TF**

Tests to verify the compatibility of aluminum and MMH with Freon TF were conducted in the burn pit on 10 October 1967. There were four attempts made to detonate various mixtures of Freon with two E81 blasting caps. No detonations resulted and no evidence of burning or other reaction was observed.

The composition of the samples and approximate quantities involved were:

Test		Freon Volume
No. 1	Freon TF only	150 ml.
No. 2	Aluminum powder 54 gm.	150 ml.
No. 3	Aluminum turnings 33 gm. saturated with sulfur-base cutting oil.	150 ml.
No. 4	MMH 70 ml.	150 ml.

H. Weiss
Technical Advisor
Field Laboratories

HW:mt

Distribution

D. M. Carpenter	096-200	SS-12
A. L. Di Sepio	D/052	SS-12
J. J. Molloy	D/051	CA-06
C. J. Rozas	D/051	SS-12
L. C. Stuckenbruck	991-350	SS-11

IE-3-0175

INTERNAL LETTER
North American Aviation, Inc.

Date	7 October 1966		
TO	Lt. A. L. DiSepio	FROM	C. C. Stough
Address	052 Z-12	Address	022 Z-12
Phone	5285		

Subject: Chemical Disposal Area - Acid Pit Dam

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Carl C. Stough

C. C. Stough
Industrial Engineering

Approved:
D. S. Venning, Supervisor
Industrial Engineering

dc: D. C. Nelson DCN D/022 Z-12

CCS:ar

O.S. 67-49

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North American Aviation, Inc.

Date 11 October 1967

TO R. J. Lodge
Address 096-200 Zone 12
Rocketdyne, SSFL

FROM Operations Surveillance
Address 096-200 Zone 12
Rocketdyne, SSFL

Phone

Subject **Materials Compatibility Tests with Freon TF**

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The composition of the samples and approximate quantities involved were:

Test		Freon Volume
No. 1	Freon TF only	150 ml.
No. 2	Aluminum powder 54 gm.	150 ml.
No. 3	Aluminum turnings 33 gm. saturated with sulfur-base cutting oil.	150 ml.
No. 4	MMH 70 ml.	150 ml.

H. Weiss
Technical Advisor
Field Laboratories

HW:mt

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C. J. Rozas	D/051	SS-12
L. C. Stuckenbruck	991-350	SS-11

INTERNAL LETTER
North American Aviation, Inc.

Date 28 February 1968

TO Captain J. E. Ecroyd
Address D/052 - Canoga

FROM Lieutenant A. L. DiSepio
Address D/052- SSFL - Zone 12

Phone 5520

Subject MATERIALS COMPATIBILITY SCREENING;
D/052 Demonstration Area I - SSFL

On Friday, 23 February 1968, at the requests of Operations Surveillance and Industrial Hygiene & Safety, SSFL, Materials Compatibility Screening tests were conducted by Protective Services in the subject area.

The tests, a series of four, were as listed and explained:

TEST NO. 1

Introducing about 4 oz. of Isopropyl Alcohol into a 4" x 4" x 8" cardboard box containing about 4 oz. of NTO.

Reason: To determine the hypergolic reaction possibility of the liquids.

Result: No hypergolic reaction.

TEST NO. 2

Introducing 150 ML of NTO into a 4" x 4" x 8" cardboard box containing a 150 ML mixture of 30% Alcohol and 70% H20.

Note: The box, for this test, was previously equipped with two #-81 blasting caps and placed on the ground upon a 12" x 18" flat sheet of 3/8" Aluminum.

Reason: To determine if the mass could be detonated by induced shock.

Result: Immediately upon application of electrical energy to the blasting caps, a high order detonation was noted. Inspection of the Aluminum plate revealed a heavy base outlining indentation of the used box.

TEST NO. 3

Introducing 150 ML of NTO into a 4" x 4" x 8" cardboard box containing 4000 PPM of Isopropyl Alcohol in 150 ML of H20.

Note: For this test the cardboard box had been prepared and placed as in test No. 2.

Reason: To determine if the mass could be detonated by induced shock.

Result: No detonation of the mass was achieved.

It was visibly noted that the two blasting caps, upon their actuation, had damaged the box and had caused the contained liquids to be expelled about the box area.

TEST NO. 4

Introducing of 4 oz. of a 50-50 Hydrazine admixture into a 4" x 4" x 8" cardboard box containing five small samples of Condor Grains (HMX propellant).

Reason: To determine the hypergolic reaction possibility of the two materials.

Result: No hypergolic reaction.

The grains were inspected after they were removed from the Hydrazine and rinsed in water.

Inspection revealed a slight change in grain color, from their original yellow to a lighter yellow. This was attributed to the corrosive action of the Hydrazine admixture.

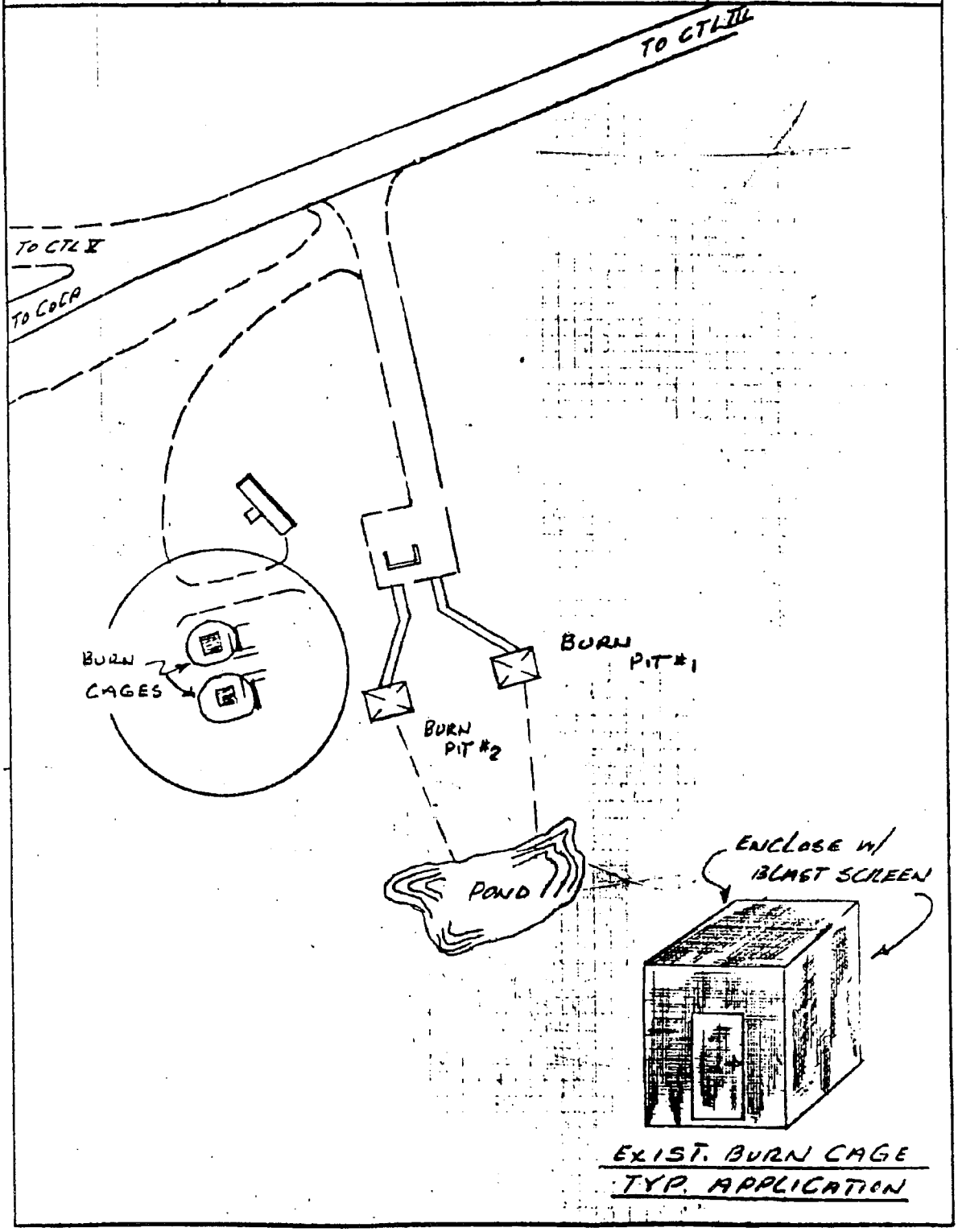
Engineering Work Request, Form R-94-1, No. [illegible], initiated by Operations Surveillance, is attached.

A. L. Dilepio

A. L. DISEPIO
Lieutenant, Protective Services
Santa Susana Field Laboratory

ALD:vm
cc:
J. L. Jones (info)
File

PREPARED BY: B. JOHNSON	**ROCKETDYNE** A DIVISION OF NORTH AMERICAN AVIATION, INC	PAGE NO. 1 OF
CHECKED BY:	PROPELLANT DISPOSAL	REPORT NO.
DATE: 3-26-68	AREA - (BURN PITS) AREA I	MODEL NO.



PREPARED BY: B. JOHNSON	ROCKETDYNE A DIVISION OF NORTH AMERICAN AVIATION, INC	PAGE NO. 2 OF
CHECKED BY:	PROPELLANT DISPOSAL	REPORT NO.
DATE: 3-26-68	AREA - (BURN PITS) AREA I	MODEL NO.

RECOMMENDATION

SUBJECT: WASTE AND PROPELLANT BURNING — UTILIZING RECESSED PITS & CAGE ASS'BLY.

REF: PHONE CONVERSATION PER A.C. DISERIO DATED 3-25-68 — & J. WITHERSPOON 3-26-68.

A REQUEST WAS RECIEVED VERBALLY TO REVIEW THE BURNING CAPABILITY AT THE PROPELLANT DISPOSAL AREA - AREA I. IN VIEW OF RECENT REQUIREMENTS TO DISPOSE OF AN UNUSUAL HIGH QUANTITY OF WASTES AND PROPELLANTS FROM THE RESEARCH AREA A DETERMINATION WAS RECOMMENDED BY INDUSTRIAL ENGINEERING AND IS AS FOLLOWS:

1. TO UPGRADE ONE EXISTING BURN CAGE BY THE ADDITION OF SHRAPNEL AND BLAST SCREEN TO BE ATTACHED ON FOUR (4) SIDES TOP & DOOR OPENING.

2. TO FABRICATE NEW FRAME SIMILAR IN SIZE AND CONFIGURATION OF PRESENT GEOMETRY. FRAME TO BE DESIGNED OF 2 1/2 x 2 1/2" x 1/4" L STEEL, BRACED AS REQ'D. AND TO BE ENCLOSED ON FOUR (4) SIDES, TOP, AND DOOR OPENING, BY BLAST AND SHRAPNEL SCREEN.

3. SIZE, AMOUNT, TYPE AND CHEMISTRY TO BE BURNED OR DISPOSED SHALL REMAIN AS DETERMINABLE BY D/053 FIRE AND SAFETY STANDARDS.

4. OPERATIONS, METHODS, BURNING TIME ETC. AS DETERMINED BY D/053.

W. A. JOHNSON
INDUSTRIAL ENGINEERING

BNA03134605

19 June 1968

Lt. K. M. Hardman
D/052 - CA01

Lt. A. L. DiSepio
D/052 - SSFL - Zone 12

5520

CHEMICAL DISPOSAL AREA - SSFL
Ammunition Purchase Request

Reference: General Order from O.C. Ledbetter, D/052 to Firemen, dated 20 June 1966; subject: Chemical Disposal Operations, SSFL, Instructions and Safe Operating Procedure (Revised)

A 30:06 rifle with armor piercing shells is utilized as per the referenced order, to dispose of when necessary, defective or non-returnable vessels that contain dangerous or toxic materials.

It is necessary, in the accomplishment of this type of disposal, that a supply of rifle shells be readily available.

It is requested that the following items be purchased and sent to the writer for proper dispensing and control:

Material:

30:06 armor piercing rifle shells

Quantity:	Price:
220 rounds	$14.95 less tax

Suggested vendor: Pony Express Sport Shop, Inc.
17460 Ventura Blvd.
Encino, California
Telephone: 788-0123

ALD:tm
cc: J. H. Ecroyd
File

A. L. DISEPIO
Lieutenant, Protective Services
Santa Susana Field Laboratory

Memo:
These items were purchased and payed for by the writer and Bill sent to C. Bowers - Canoga - H & E

INTERNAL LETTER
North American Aviation, Inc.

Date: 16 August 1968

TO Address: PROTECTIVE SERVICES PERSONNEL
D/052 - SSFL - Zone 12

FROM Address: Captain J. H. Ecroyd
D/052 - SSFL - Zone 12

Phone: 5515

Subject: NTO DISPOSAL - EWR 532370
Special Instructions

The following methods will be adhered to for the disposal of nitrogen tetroxide, (NTO) contained within ten (10) vessels of special design, received at the Protective Services Chemical Disposal Area from the Polymer Development Area, (PDA).

Pit 3 and its area will be utilized for this disposal operation.

NOTE: Applicable Chemical Disposal Area procedures will be adhered to and followed.

I PRE-DISPOSAL OPERATIONS

A- Prior to commencing any disposal operations the Protective Services personnel assigned will: Complete all notifications and announcements as required for the disposal of NTO.

B- Raise Red Flag, lower Yellow Flag, turn on area Red Light.

II SAFETY CLOTHING & EQUIPMENT

Group I safety clothing and equipment will be worn for this disposal operation.

III DISPOSAL METHODS

A- Position a vessel in the proper manner for best disposal of its contents and secure vessel adequately.

B- Fill Pit 3 with water. Do not overflow this pit.

C- Attach sufficient piping from the vessel's discharge port so that the free end is terminated approximately two feet beneath the Pit 3 water level.

D- Attach piping from a controlled GN2 supply source to the pressurizing port of the vessel. GN2 controlled supply cylinder is to be approximately twenty feet from the vessel.

E- Open discharge port valve of vessel to allow internal pressures to be relieved.

F- When internal vessel pressures have been relieved, open GN2 supply valve. Regulate GN2 discharge supply to about 15 PSI.

G- Open pressurizing port valve on vessel, allowing GN2 pressure to enter vessel.

H- Control liquid flow from vessel by regulating GN2 purge supply.

I- When liquid flow has ceased maintain a purge on the vessel for about ten (10) minutes.

J- Close pressurizing port valve on vessel, shut off GN2 supply.

K- When internal purge pressures of vessel have been evacuated, close discharge port valve of vessel.

L- Remove all piping installed for the disposal operation.

M- For any unusual, or dangerous conditions noted immediately notify the Shift Commander and the Control Center.

IV POST DISPOSAL OPERATIONS

When the disposal operations have been completed the personnel assigned to the disposal will:

A- Make all necessary notifications and announcements as required on completion of a disposal operations.

B- Lower Red flag, raise Yellow flag, turn off area Red light.

C- Ascertain that all tools and equipment used are properly cleaned and stored.

D- Clean and store safety clothing and equipment used.

E- Band emptied vessels to pallets, and initiate their return to PDA.

F- Clean up and secure the area.

JHE:tm

J. H. ECROYD
Captain, Protective Services
Santa Susana Field Laboratory

ROCKETDYNE
A DIVISION OF NORTH AMERICAN ROCKWELL CORPORATION
6633 CANOGA AVENUE, CANOGA PARK, CALIFORNIA 91304

7 April 1969

IN REPLY REFER TO:
69RC3648

Subject: Facilities Contract AF04(695)-992
Air Pollution Control Proposal,
RC-69-CTR-7F, Air Force Plant No. 57

To: Headquarters
Space and Missile Systems Organization
Air Force Systems Command
Air Force Unit Post Office
Los Angeles, California 90045

Attention: SMKIF - Industrial Facilities Branch

Through: Air Force Plant Representative, Rocketdyne

1. California water regulations prohibit the off property release of water containing floatable hydrocarbons. At Air Force Plant No. 57, the present method of complying with these regulations is to retain in a pond raw fuel, lube oil and other hydrocarbons from test operations, and dispose of floatable hydrocarbons by burning.

2. Recently, Ventura County Air Pollution Control District Rule 18 on air pollution was adopted. One of the limitations imposed by Rule 18 is that disposal of hydrocarbons by open burning is not permitted.

3. It is now necessary to dispose of residual hydrocarbons by the acquisition and use of an approved burner or removal and disposal off the property by disposal contractors. A recent study performed by the Contractor has determined that, with the quantities presently anticipated, the latter removal method is the most economical.

4. The test areas affected by this change are Alfa and Bravo, which have a common hydrocarbon retention pond. Rehabilitation and modifications must now be made to this pond, and devices installed to separate and remove the fuel/oil from the water.

Was this approved? or disapproved? copy of disapproval with record of disapproval

5. The Contractor therefore submits, as Enclosure (1), an industrial facilities proposal for funds in the amount of $7,100, to rehabilitate and modify the Alfa-Bravo Pond, and acquire and install a fuel/oil separator. To permit early compliance with the Ventura County Air Pollution Control District Rule 18, expeditious approval and funding of this proposal is requested.

6. If further information is required concerning this proposal, please call Mr. R. C. Mauck, Telephone: 213-884-3191.

NORTH AMERICAN ROCKWELL CORPORATION
Rocketdyne Division

T. E. Myers

T. E. Myers
Vice President
Operations

TEM/RCM/pmn

Enc. (1) Ten (10) Copies of Appendix "A," RC-69-CTR-7F

cc: T. B. Swaggerty, NASA/Rocketdyne
(With Five (5) Copies of Enclosure)

ROCKETDYNE
A DIVISION OF NORTH AMERICAN ROCKWELL CORPORATION

INDUSTRIAL FACILITIES
APPENDIX A

SCHEDULE II (d-1)

Item Rehabilitate Alfa-Bravo Pond Item No. 201

Location Air Force Plant No. 57

Associated Schedule II (c)
Title I A&E Services $ 390

Associated Schedule II (c)
Title II A&E Services $ 210

Estimated Total Cost Excluding A&E $ 6,500

Total A&E Services $ 600

PROJECT DESCRIPTION

This project consists of rehabilitation of the Alfa-Bravo Pond at the Santa Susana Field Laboratory to comply with Federal and State regulations. The scope of work will include:

1. Provide fill, compact, grade and shape, and apply 4-inch concrete to the spillway.
2. Cut and remove existing skimmers and replace with two 36-inch CMP skimming devices.
3. Excavate and cut existing culverts and install approximately 18 lineal feet of 30-inch CMP.
4. Excavate and install 6-inch underdrain line and valve, and backfill and compact.
5. Grade and construct one 6 by 8 by 4 inch concrete base for an oil separator.
6. Fabricate and install a steel support platform.
7. Purchase and install one 75 GPM, Zurin, Model 1188, or equal oil separator; one 3HP, 75 GPM, Demming, Model 3304 or equal gasoline engine pump; one floating skimmer, and related suction and discharge hoses.

JUSTIFICATION

The Alfa-Bravo pond traps and retains raw fuel, lube oil, and other hydrocarbons from test firings and/or spills in the Alfa-Bravo test area.

California water regulations prohibits the flowing of water off property that contains floatable hydrocarbons. In order to comply with these regulations, disposal of the fuel residue has been accomplished by burning.

However, the enactment of air pollution controls by the Federal Government, Public Law 88-206, "Clean Air Act" and by the Ventura County Air Pollution Control District, Rule 18, now denies disposing of the hydrocarbons by burning. To comply with these regulations, it is necessary to rehabilitate the Alfa-Bravo pond and install an approved method for separating the fuel/oil from the water for disposal off property.

Rehabilitation of the pond is required in that during the eleven years of use as a burn-off pond, the skimming devices have been rendered inoperable and the gunite spillway has literally disintegrated.

Further, rain storms caused an overflow of the dam which eroded the embankment. This condition must be repaired to prevent hydrocarbons flowing off property.

By providing this project as described, compliance with Federal, State, and local pollution abatement requirements will be satisfied.

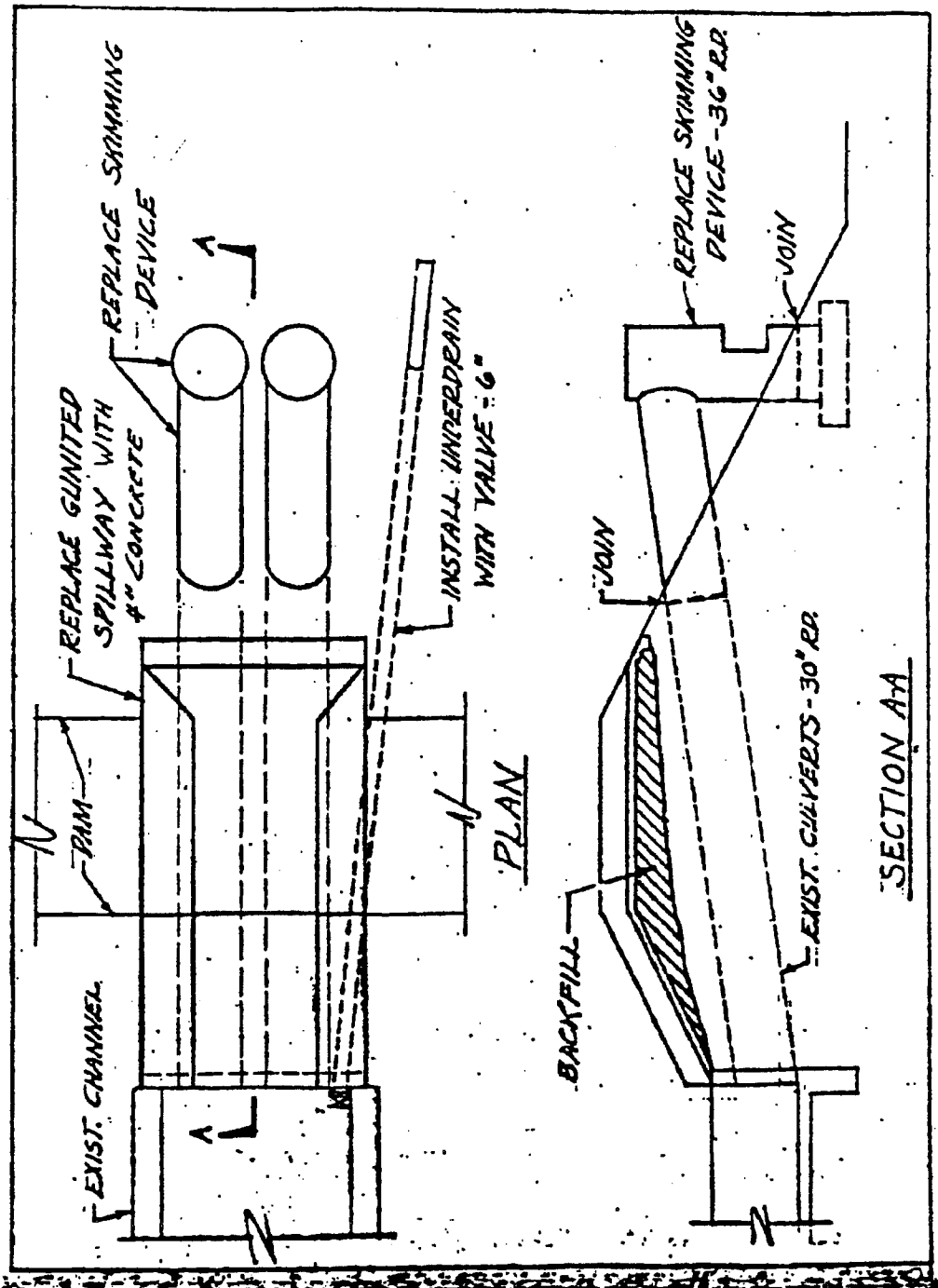
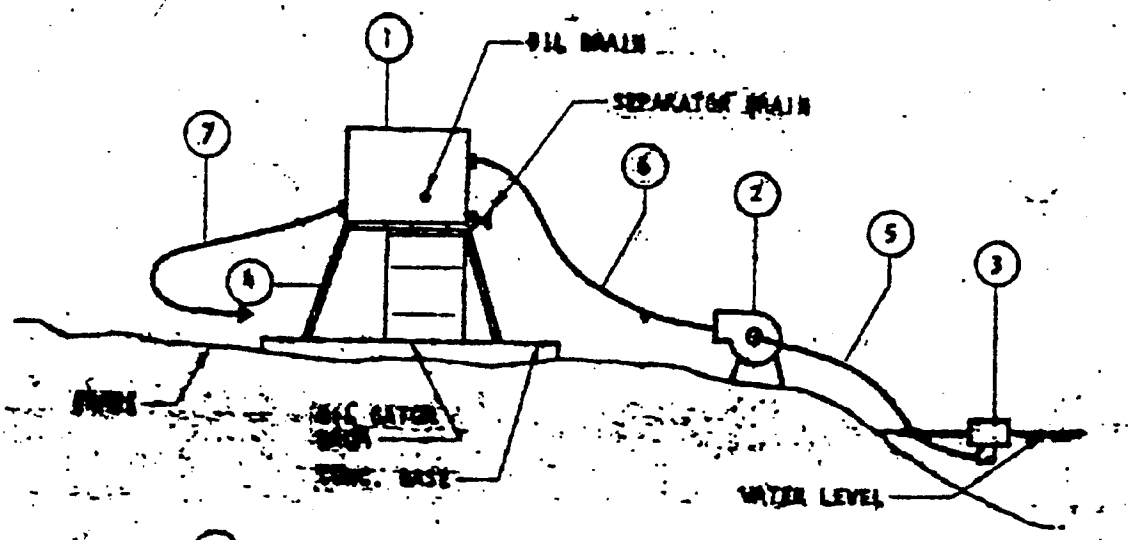


Figure 1 - Rehabilitate Alfa-Bravo Pond



1. OIL SEPARATOR - 75GPM
2. PUMP - GASOLINE ENG. POWER - 3 HP 75GPM @ 50 FT
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]
7. [illegible]

Figure 2 - Rehabilitation Alfa-Draw Pond

PEP 69-11

Date 24 April 1969

TO Address: T. A. Coultas, D/991-350 SS11, Rocketdyne, SSFL

FROM Address: G. D. Artz, D/991-555 SS11, Rocketdyne, SSFL

Phone 5143

Subject: Experimental Certification

Reference: (1) RR 65-35 "Evaluation of the J-2 Fragment Shield" by J. W. Goheen, September 1965

Distribution

D/991
L. Stuckenbruck
T. Coultas
J. McCarthy
E. Lockwood
E. O'Hara
W. Kennedy
G. Artz

D/051
J. Thompson

D/052
Lt. A. DiSepio

A series of experiments is planned to develop, construct and calibrate a fragment launching system capable of firing a 100-grain (6.45 grams) fragment at a velocity of 7,000 feet per second. A fragment launching system much like the one used for the J-2 fragment shield study (Ref. 1) is contemplated. Approximately one pound of high explosive (Comp. C-4) will be used for each test shot. The primary hazards to be protected against are:

(1) handling the high explosive and blasting caps
(2) keeping the high velocity fragment under control
(3) eliminating or minimizing scrapnel

The following information is relevant to these experiments:

1. Title and G.O. Number

Explosive Launcher for High Velocity Fragment for F-15 (FX) Survivability Tests.
IDWA 22010-64053

2. Customer

Los Angeles Division, NR
Research and Engineering
Systems Application D/056-064
Ken Schmidt, Project Engineer 3-259-4201

3. Responsible Engineer

G. D. Artz

4. Support Personnel

E. E. Lockwood
Ed O'Hara
Carl Brunswick

5. Test Stand

Chemical Disposal Area (Burn Pit) - Area I - SSFL

6. Object of the Experiments

To simulate high explosive warhead fragments and velocities and determine their effect on F-15 (FX) type aircraft structures and fuel tanks. The explosive launchers will be fabricated, and calibrated at SSFL using velocity screens. The aircraft survivability tests will be performed at Palmdale in LAD facilities with Rocketdyne personnel handling the explosive operations.

7. Test Methods and Equipment

The explosive launcher is shown in Figure 1. The detonator (DuPont E-51 or engineers no. 8) will initiate the high explosive, Comp. C-4 directly without the need for a booster (i.e., tetryl). The shock wave generated by the explosive will be relatively flat by the time it reaches the end of the explosive. An air gap, G, will act as an attenuator to prevent breakup of the fragment (pellet) to be launched. The plaster sabot serves to hold the pellet in the center of the blast area providing directional aiming. The conical shape of the air gap causes the plaster dust and/or particles to be launched in an angular direction away from the center line of the charge thus avoiding interference with the primary projectile and false triggering of the velocity screen instrumentation.

The velocity of the fragment will be determined using velocity screens which make electrical contact when the fragment passes through them (Figure 2). Thin Mylar which has aluminum coating on both sides will be used for screen material. Two screens placed one foot apart and electrically connected to a microsecond interval timer or oscilloscope will be used to determine the fragment velocity. The spacing between the velocity screens must be accurately determined since the measurement error is probably the limiting factor in the accuracy of the velocity determination. A typical test setup is shown in Figure 3, showing the blast plate which protects the velocity screens and target area from extraneous fragments of plaster and explosive container. Figure 4 shows the test set-up for the calibration shots.

8. Test Schedule

Testing is tentatively scheduled to begin the latter part of week ending 26 April or early the following week. A series of tests will be performed to determine the fragment velocity as functions of air gap and explosive charge weight. These tests should be completed by 1 May including a minimum of three calibration shots at or near the desired 7000 ft/sec velocity. Tests at Palmdale will be scheduled by LAD and are now tentatively planned for early May.

9. Test Procedure

A. The explosive fragment projector, as shown in Figure 1 (minus detonator), is assembled in one of the test cells in the Tunnel Area. The Comp. C-4 must be lightly (~ 50 psi) pressed to minimize voids and insure a flat face on the explosive surface. The plaster sabot containing the fragment to be launched must be glued into the micarta tubing at a specified distance from the explosive surface. The first test will use a 1 inch gap between the explosive and the fragment.

The standard explosive handling procedures will be used as described in Research Procedures Manual, Procedures 901, 902, 903, 904, and 905 (except where they refer specifically to operations only applicable in the Ranch House Area).

A series of three explosive fragment projectors will be made up a time. The plaster sabots will be glued in just prior to test so that the gap distance can be varied from one shot to the next.

The explosive demolition blocks (Comp. C-4) used to prepare the explosive charge will be removed from the magazine, not more than five pounds at a time and transported to the Tunnel Area for assembly. After assembly of the three test projectors the remaining explosive material will be returned to the magazine and the assembled projectors transported to the CDA test area. Transport of all explosives must be accomplished per Procedure 905.

B. The assembled projector will be attached to the blast shield plate (see Figs. 3 and 4) which has previously been set up in the test area.

C. The red flag must be showing during all operations with explosives. Personnel and/or vehicular traffic may be allowed to enter or pass through the area only if actual explosive operations cease (explosive may remain in the area, however). Just prior to hook-up of the detonator, road blocks shall be established on the Coca, CTL V, and CTL III access roads and no traffic will be permitted into or through the area until the test is completed. All personnel except one shall leave the immediate test area.

D. Hook-up the detonator - The detonator shall be placed in a protective shield (section of high pressure tubing open on both ends) prior to actually making the electrical hook-up to protect against possible inadvertent circuit failure or electrostatic discharge firing of the detonator.

E. Place the detonator in the cavity in the Comp. C-4 explosive charge.

F. Return to the control point.

G. Announce impending test per standard procedure, have road blocks ensure all traffic blocked and observable area clear.

H. Confirm instrumentation readiness.

I. Fire with normal countdown procedure.

J. Announce all clear and open area for normal operations.

10. Safety Measures

A. Expose the minimum number of personnel for the minimum period of time in any explosive operation.

B. Use protective devices:

(1) Safety glasses, grounded shoes, anti-static clothing must be worn.
(2) Detonator hook-up man must always have key for firing panel.
(3) Install detonator in protective shield prior to electrical hook-up.
(4) Always hook-up detonator before installing it in explosive. Make any inadvertent explosion as small as possible.

C. In the event of a misfire:

(1) Check detonator circuit continuity if detonator did not fire.
(2) If circuit resistance is still within resistance limits of detonator, check for shorts and/or bad contacts in firing circuit box.
(3) After 15 minutes, one man may go into test cell and remove detonator from explosive charge, then check continuity of detonator with detonator in protective shield. If detonator is okay check rest of electrical circuitry.
(4) If detonator fired but main explosive charge did not detonate - wait 15 minutes, remove firing circuit key, then one man may go into test cell, clean up explosive pieces scattered in area, remove test set up, remove explosive for scrap disposal, remove plaster sabot and test fragment from holder and save for subsequent test. Set up for next test.
(5) If detonator did not fire but shows no continuity after test attempt - check for open circuit in firing panel. After 15 minutes one man may go into test cell, remove detonator and check continuity. If detonator has open circuit, remove it for disposal, replace with another detonator and proceed to test as before.

D. The firings will be made in dug out area adjacent to the solid propellant and igniter burn cage number 1 (furthest from Coca Road). This will ensure that the projectile to be launched will impact in the dirt sidewall of pit area. The effect of the blast wave, on the burn cage adjacent to the test, is not completely known at this time but it is presumed to be slight. If the first test indicates otherwise, suitable alterations will be made to insure that no fragments are blown out of the immediate area and any necessary repairs will be made to the burn cage.

E. No explosive material or blasting caps will be left unattended in the Chemical Disposal Area. All materials not used up will be returned to the magazine or destroyed immediately as applicable.

11. Sources of Coordination, Assistance, etc.

Responsible Engineer		
G. D. Artz	Ext. 5143	(348-7460)
E. E. Lockwood	Ext. 5175	
E. J. O'Hara	Ext. 5305	
Emergency	Ext. 5333	
Safety	Ext. 5272	(Jim Thompson)
Fire Protection	Ext. 5520	(Lt. A. L. DiSepio)
Medical - Canoga	Ext. 2331	

G. D. Artz
Member of the Technical Staff
Pyrotechnic and Explosive Processes

12. Approvals

L. C. Stuckenbruck
Principal Scientist
Pryotechnic and Explosive Processes
Research Division

J. L. Thompson
Industrial Hygiene & Safety

J. R. McCarthy
Principal Scientist
Operations and Technical Services
Research Division

Lt. A. L. DiSepio
Protective Services

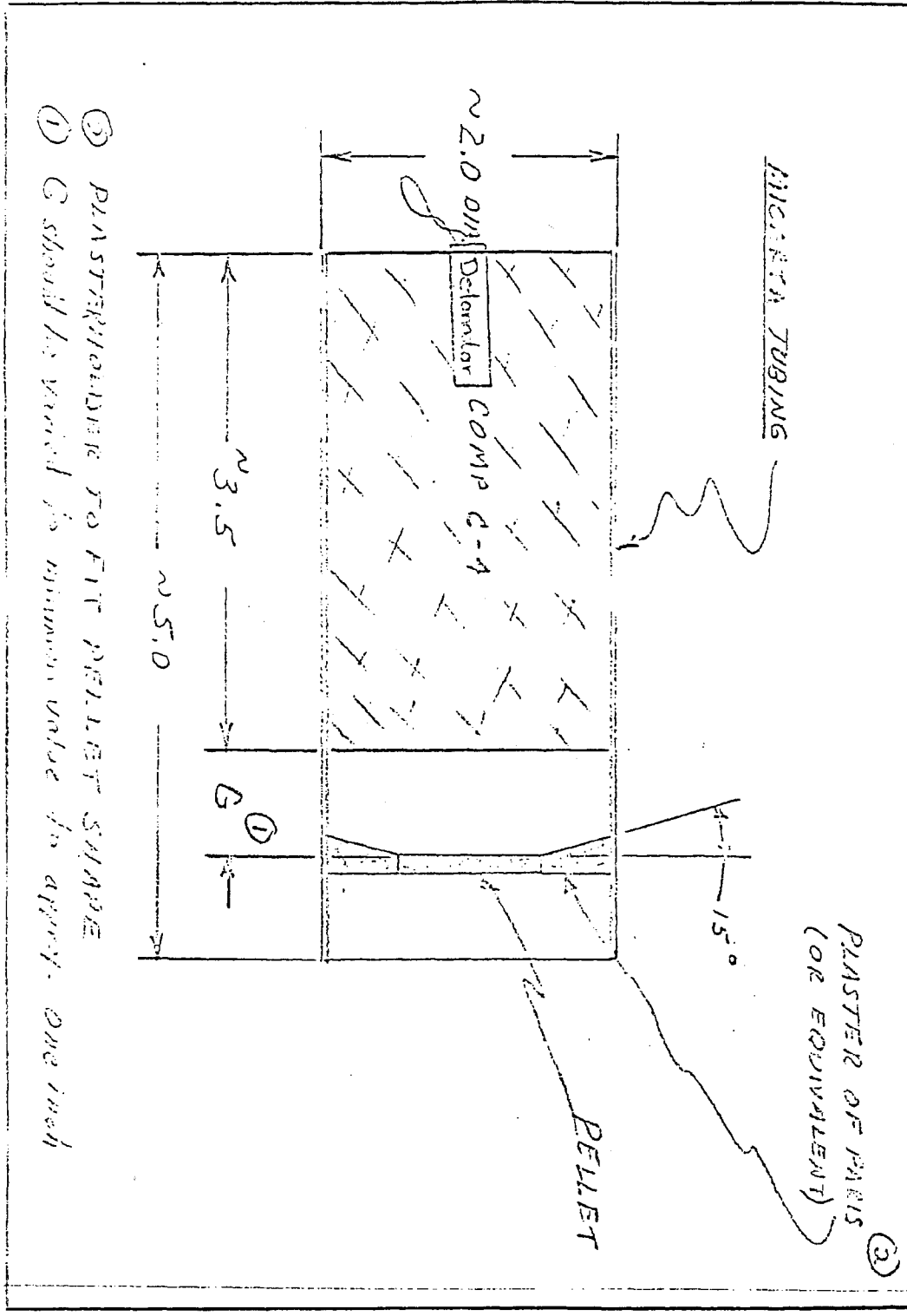
T. A. Coultas
Manager
Engineering Sciences
Research Division

sl

CHECK LIST

1.	Area on red.	_____
2.	Explosive projector installed.	_____
3.	Firing circuit key on person.	_____
4.	Detonator under protective shield.	_____
5.	Check resistance of detonator.	_____ ohms
6.	Road blocks in place.	_____
7.	Detonator hooked-up to firing circuit.	_____
8.	Detonator installed in explosive.	_____
9.	Announce test.	_____
10.	All traffic blocked and area clear.	_____
11.	Instrumentation ready.	_____
12.	Fire	_____
13.	Area all clear sounded.	_____

PREPARED BY: EEL	ROCKETDYNE A DIVISION OF NORTH AMERICAN ROCKWELL CORPORATION	PAGE NO. OF
CHECKED BY: G.	FIGURE 1	REPORT NO.
DATE: 4-21-69	Explosive Fragment Projector	MODEL NO.



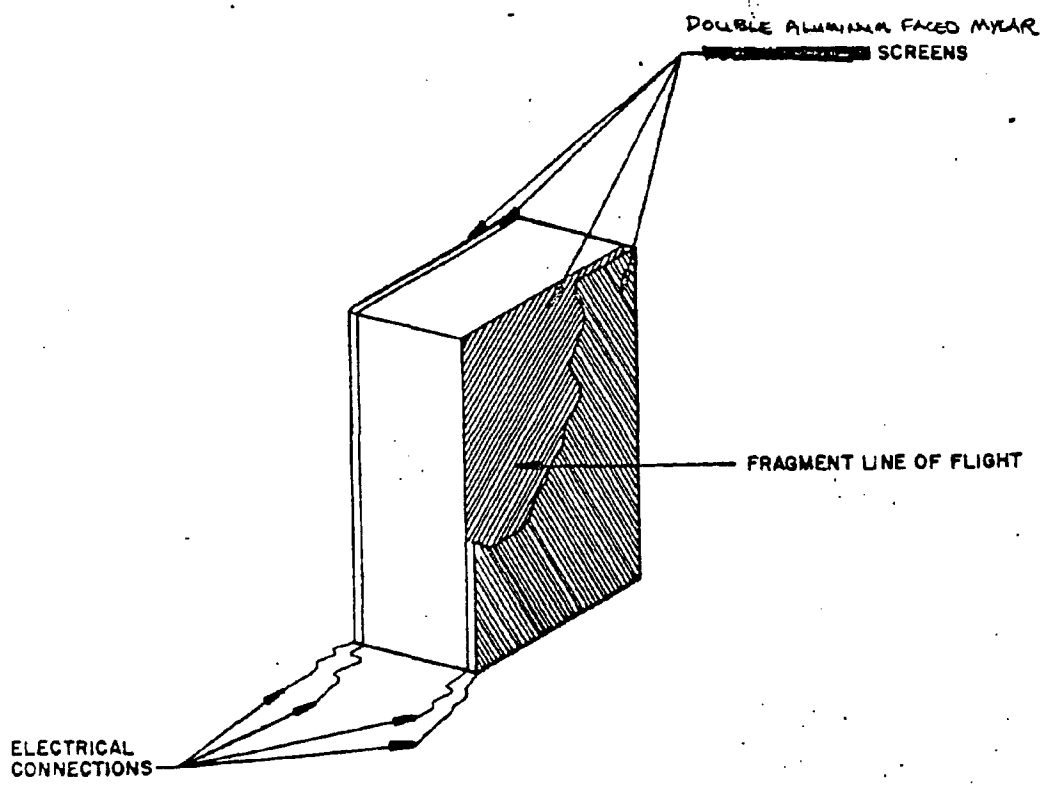


Figure 2. Make Circuit Velocity Screens

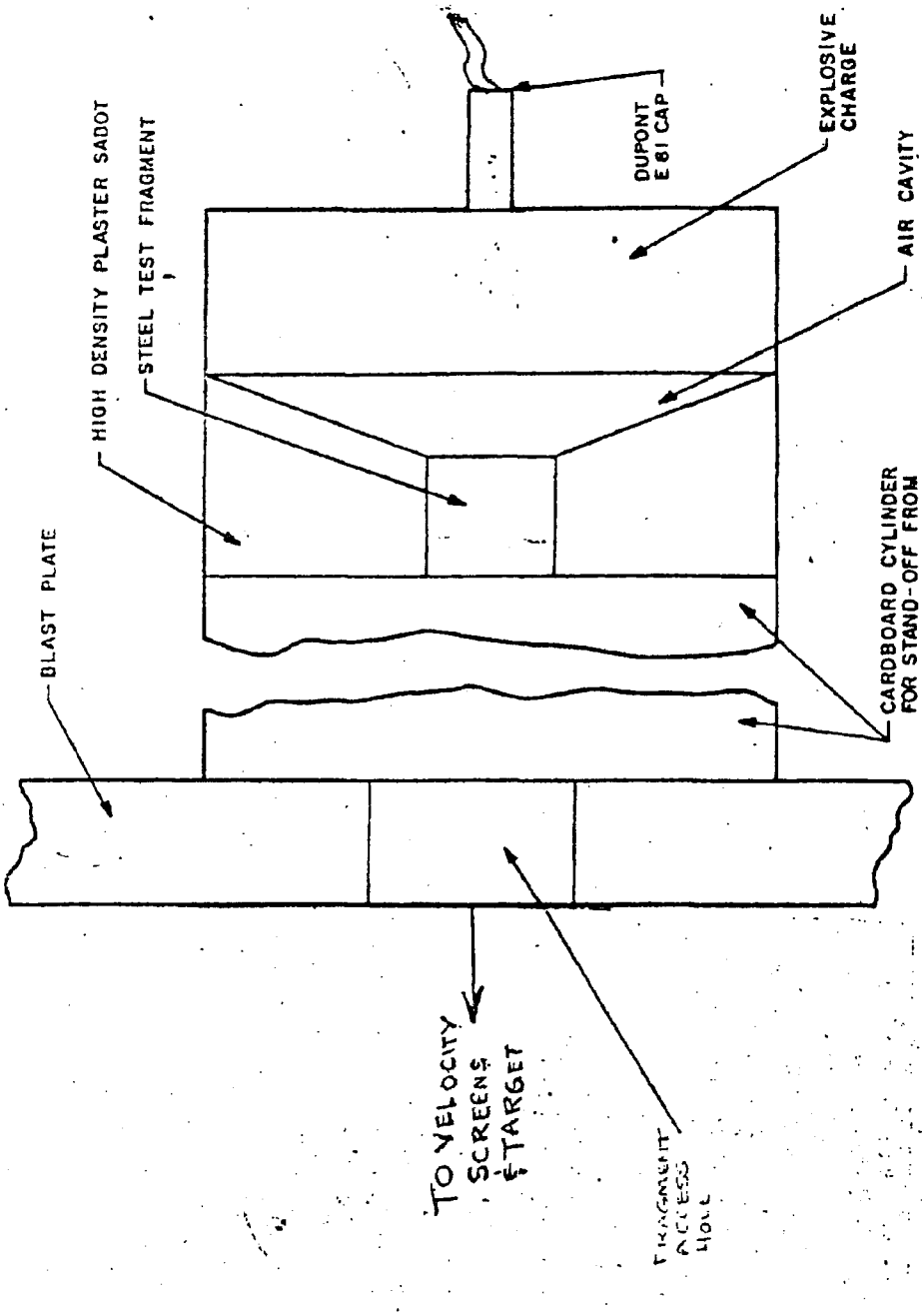
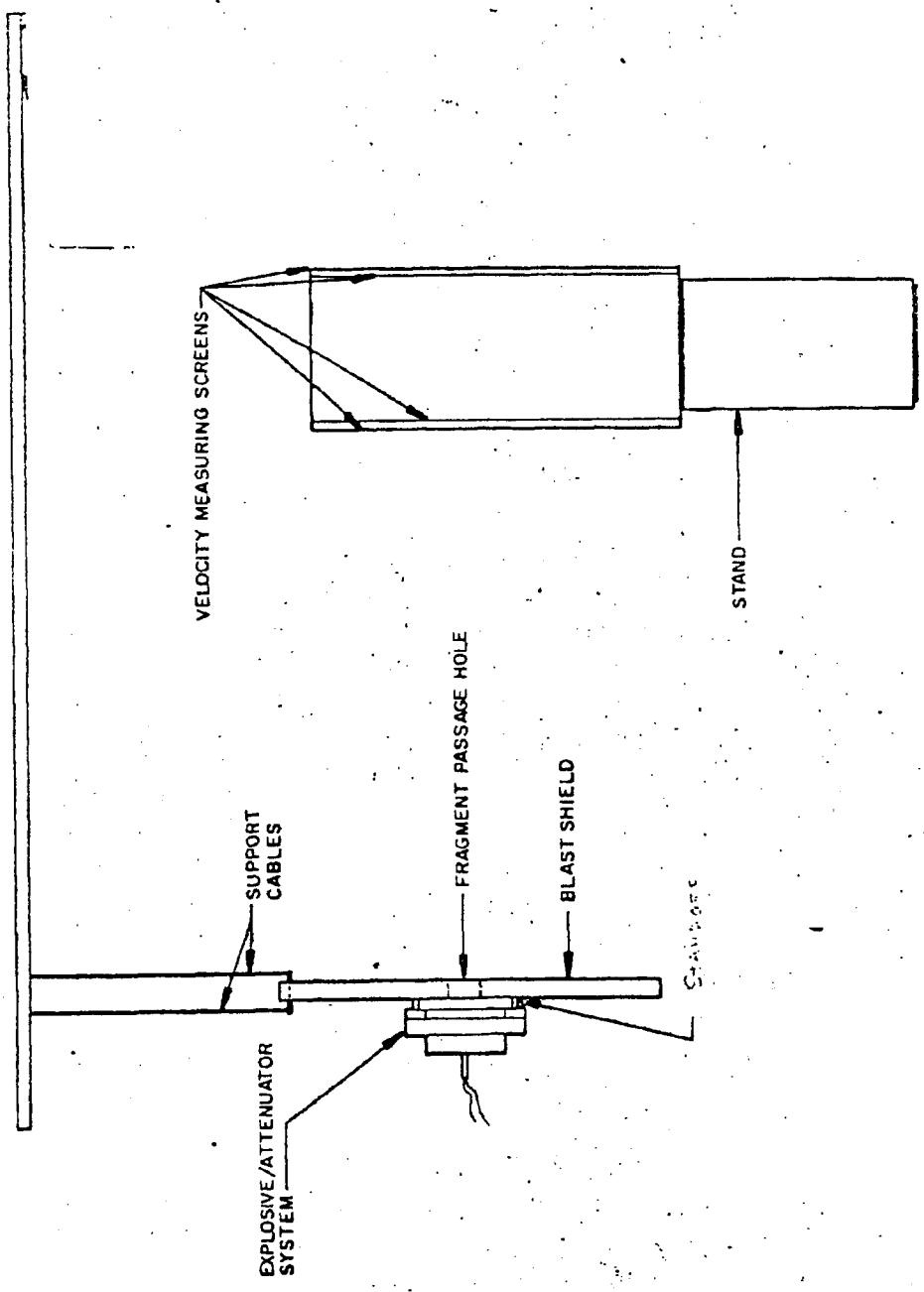


Figure 11. Arrangement of Air Cavity Launch System with Break Circuit Velocity Screen



INTERNAL LETTER

NORTH AMERICAN ROCKWELL CORPORATION
AEROSPACE AND SYSTEMS GROUP

Date April 24, 1969

TO R. W. Hartzler
Address D/765 AH19

FROM R. R. Davidson
Address D/767 AH18

Phone 1843

Subject Ventura County Air Pollution Control

The Atomics International application for permit to operate existing equipment at our Santa Susana facility, in compliance with Rule 18 of the Ventura County APCD Rules and Regulations, was submitted as required by April 21, 1969.

Our facilities at Santa Susana currently have only one gray area with respect to air pollution control. This is our open burning operation at the sodium disposal facility.

Open burning of combustible rubbish, in general, must be discontinued. Open burning to instruct employees in methods of fighting fires, and for prevention or elimination of a hazard which cannot be abated by any other means, is permitted.

With respect to open burning, our permit application states "The sodium disposal facility, area 886, is an isolated area equipped for disposal of hazardous materials by open burning, and for periodic training of employees in methods of fighting sodium fires. The Ventura County Fire Department will be notified in advance of burning operations." This approach to the subject was recommended by and coordinated with H. Weiss of Rocketdyne, following a recent meeting between Mr. Weiss and R. B. Atherton, the Ventura County Air Pollution Engineer.

Mr. Atherton is in agreement with our need for open burning as a means of disposing of hazardous materials and training personnel, but he emphatically requests that we do not dispose of petroleum products or other hydro-carbons by open burning.

At our disposal facility, small quantities of sodium are disposed of by water reaction, but this method for large quantities of sodium becomes too violent and hazardous. Burning the sodium in a dry environment requires a supporting fire which, in past practice, has been supplied by simultaneously burning waste oils, sano-wax, and other combustible rubbish. Since this practice is no longer permissible, an auxiliary means of heating and burning metallic sodium will have to be provided by extending the natural gas service from Building 009 to the burn area, or providing L.P. gas services.

Our next action will provide cost estimates for extending the natural gas services versus propane costs.

I also feel we should do a preliminary conceptual cost study on limited scrubbing equipment, and/or Vendor disposal services, and we will proceed with these unless otherwise directed.

R. R. Davidson
Design Specialist
Facilities Engineering

RRD/st

cc: F. C. Burnett D/767 AH18
F. R. Corning D/752 S040