

68-27

197

Mason & Flanger-
Silas Mason Co., Inc.

MHSMR-68-2 I

ENGINEERS AND CONTRACTORS

SINCE 1827

Pantex Plant

OBLIQUE IMPACT SENSITIVITY OF EXPLOSIVES

THE SKID TEST

Quarterly Report for April, May, June, 1968

Engineering Order Nos. 504-198 and 504-003

Bill M. Washburn



— DEVELOPMENT DIVISION —

MASTER

dy

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

OBLIQUE IMPACT SENSITIVITY OF EXPLOSIVES

THE SKID TEST

This project concerns the use and study of a sensitivity test for large explosive charges to oblique impact, a condition resembling possible operational accidents.

Bill M. Washburn

Quarterly Report for April, May, June, 1968

Engineering Order Nos. 504-198 and 504-003

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

**Portions of this document may be illegible
in electronic image products. Images are
produced from the best available original
document.**

ABSTRACT

RX-04-CW, LX-07-1, and RX-09-CD were tested. The RX-04-CW and LX-07-1 are not complete; however, results so far show the RX-04-CW comparable in sensitivity to PBX 9404 while the LX-07-1 is less sensitive at 14°. The RX-09-CD was slightly more sensitive than the RX-09-CB previously tested.

PREVIOUS APPLICABLE WORK

Several RX-09 formulations have been tested; all were relatively sensitive with #6 reactions at low heights when impacting at 14°. Of all the RX-09's tested, RX-09-CB appeared to be the most desirable material based on sensitivity.

DISCUSSION

One formulation of RX-09, LX-07-1 and RX-04-CW (an HMX-Viton variant) was tested to determine the skid sensitivity. Compositions of the formulations were as follows:

RX-09-CD Lot 8117-114-01	HMX/DNPA/FEFO (94.3/3.6/1.7 % by weight) 3/4 Class A 701-26 and 1/4 Class B SR-1B-65 HMX/AG Run 3 DNPA/AG FEOF
LX-07-1 Lot 71-10 & 71-11	HMX/Viton A (92.2/9.8 % by weight) Special Grade (700-10) HMX/Lot 17 & Lot 18 Viton A
RX-04-CW Lot LRL 7639	HMX/Viton A (94.14/5.86 % by weight)

The test pieces were stored in a 60°F chamber pending testing. The test results are listed below and in Table I. Some trouble was encountered with the target pad: the epoxy bond to the steel plate was imperfect, so that upon impact of the test piece, the epoxy would flake off. This caused two tests to be discounted. Prior to bonding the steel plates to the concrete block, all plates are now checked by ultrasonics for voids between the epoxy and steel. Those plates showing voids (~ 25%) are discarded.

<u>Material</u>	<u>Height (ft)</u>	<u>Angle (°)</u>	<u>Results (Reaction Level in Sequence of Tests)</u>
RX-09-CD	.88	14	6,6,0,0
	2.5	45	0,0,0
LX-07-1	.88	14	0,0,0
	1.25	14	0,0,0
	1.75	14	0,0,0
	2.5	14	3,3,6
	2.5	45	0,0
RX-04-CW	.88	14	0,0,0
	1.25	14	0,6,0
	1.75	45	0,0,6
	2.5	45	0,0,0,0,0*

*The first two drops 2.5' were discounted because of the epoxy problem and questionable pieces (had been dropped several times without new surface cut).

FUTURE WORK; COMMENTS; CONCLUSIONS

Testing will be completed on RX-04-CW and LX-07-1 at the 45° level.

A large PBX 9404 hemisphere (~ 300 pounds) has been fabricated and will be tested as soon as the formulation testing is complete.

PBX 9404 will be tested at 45° in six drops from 1.75', three drops from 2.5', three drops from 3.5', and three drops from 5.0' (thus "recalibrated" at 45°).

RX-04-CW will have six tests at 1.75'/45°.

RX-04-CX (95% HMX/5% Viton) will be tested at 1.75'/45° in six drops.

Table I

Skid No.	Material	Height (ft)	Angle (°)	Reaction	Outside Temp. (°F)	Remarks
514	RX-04-CW	.88	14	0	75	One Camera
515	RX-04-CW	.88	14	0	75	No Camera
516	RX-04-CW	.88	14	0	72	No Camera
517	RX-04-CW	1.25	14	0	72	One Camera
518	RX-04-CW	1.25	14	6	72	No Camera
519	RX-04-CW	1.25	14	0	74	One Camera
520	RX-04-CW	1.75	45	0	82	One Camera
521	RX-04-CW	1.75	45	0	82	No Camera
522	RX-04-CW	1.75	45	6	82	No Camera
523*	RX-04-CW	2.5	45	0	82	One Camera
524**	RX-04-CW	2.5	45	0	69	One Camera
525	RX-09-CD	.88	14	6	72	One Camera
526	RX-09-CD	.88	14	6	86	No Camera
527	RX-09-CD	.88	14	0	86	No Camera
528	RX-09-CD	.88	14	0	86	No Camera
529	RX-04-CW	2.5	45	0	70	One Camera
530	RX-04-CW	2.5	45	0	73	No Camera
531	RX-04-CW	2.5	45	0	73	No Camera
532	LX-07-1	.88	14	0	73	One Camera
533	LX-07-1	.88	14	0	73	No Camera
534	LX-07-1	.88	14	0	74	No Camera
535	LX-07-1	1.25	14	0	78	One Camera
536	LX-07-1	1.25	14	0	80	No Camera
537	LX-07-1	1.25	14	0	80	No Camera
538	LX-07-1	1.75	14	0	80	One Camera
539	LX-07-1	1.75	14	0	80	No Camera
540	LX-07-1	1.75	14	0	78	No Camera
541	LX-07-1	2.5	14	3 to 4	60	One Camera
542	LX-07-1	2.5	14	3 to 4	75	No Camera
543	LX-07-1	2.5	14	6	76	No Camera
544	RX-09-CD	2.5	45	0	52	One Camera
545	RX-09-CD	2.5	45	6	53	No Camera
546	RX-09-CD	2.5	45	0	64	One Camera
547	LX-07-1	2.5	45	0	65	One Camera
548	LX-07-1	2.5	45	0	66	No Camera

*Sand-Epoxy surface flaked off of steel plate upon test piece impact.

**Piece which had been impacted several times; therefore, these results were discounted.