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*M. Patterson*

FILE

412

OPTICAL TECHNOLOGY DIVISION  
OPTO-MECHANICAL DESIGN ENGINEERING

Memorandum ME 49

*(only copy read)*

TO: Project File - Recovery of RV #3      DATE: August 5, 1971  
FROM: L.B. Molaskey  
SUBJECT: Penetration of the RV Into the Ocean Bottom

According to the data provided by the Navy with regard to the penetration of the RV into the ocean bottom, a revised estimate is herein presented. Not knowing the assumptions upon which the Navy's estimates were made, we can only compare the parameters stated. They are weight and velocity. All other parameters considered equal, the penetration into the ocean bottom should be proportional to the kinetic energy at impact with the bottom.

Therefore if a 1000 pound body penetrates the bottom 35 to 80% of its volume when impacting at 20 ft/sec a 1051 pound body traveling at 14 ft/sec will penetrate the bottom the same amount multiplied by the ratio of their kinetic energy or

$$P_2 = P_1 \left( \frac{KE_2}{KE_1} \right) \text{ where subscripts}$$

1 denotes conditions of first estimate and  
2 denotes conditions of updated estimates.

or

$$P_2 = (35 \text{ to } 89) \frac{1/2 M_1 V_1^2}{1/2 M_2 V_2^2}$$

since  $M = \frac{W}{G}$  and G is constant

$$P_2 = 35 \text{ to } 89 \left( \frac{1051(14)^2}{1000(20)^2} \right)$$

$$P_2 = 35(.51499) \text{ to } 89(.51499)$$

$$P_2 = 18 \text{ to } 41\%$$

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Therefore if the estimates of descent velocity are correct it can be concluded that the penetration of the RV into the bottom is probably not as bad as originally estimated.

[Redacted]

L.B. Molaskey

LBM/cj

cc:

[Redacted]

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