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DEPARTMENT OF THE AIR FORCE
STAFF MESSAGE BRANCH
INCOMING MESSAGE

AF IN: 61145 (25 Sep 68) A/fj

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ACTION: NIN-4 INFO: DIA/JCS-1, (SAFSS-3) (9)
SMB 030RTTSZYYY RUEDFIF4418 2631936-SSSS--RUEFHQA.

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R 241935Z SEP 68

FM FTD WPAFB OHIO

TO CSAF/AFNIC

BT

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SUBJECT: (U) MOONDUST.

REFERENCE DIA MSG 181559Z SEP 68.

1. AN OPERATIONAL REPORT ON THE ON-SITE NEPAL MOON DUST OPERATION HAS BEEN PREPARED IN CONJUNCTION WITH THE IR. DETAILED RESULTS OF THE OPERATION ARE PRESENTED IN THIS REPORT.
2. SPECIFIC GAINS FROM THE ON-SITE EXPLOITATION INCLUDE:
 - A. FIRST HARD DATA ON NOZZLE PASSAGE SHAPES, COOLING DISTRIBUTION TECHNIQUES, AND STRUCTURAL DESIGN.
 - B. FIRST INDICATION OF OPTIMIZED NOZZLE DESIGN BY THE SOVIETS FOR STRUCTURAL STRENGTH AND HEAT TRANSFER TO OBTAIN MINIMUM WEIGHT.
 - C. HARD DATA POINT ON GAS/AERODYNAMIC DESIGN CHARACTERISTICS.
 - D. ANOTHER DESIGN DATA POINT FOR ESTABLISHING VALIDITY AND

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CURRENCY OF SOVIET DESIGN HANDBOOK DATA.

E. FABRICATION TECHNIQUES STATE-OF-ART.

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F. COMPARATIVE DESIGN CHARACTERISTICS FOR OTHER SENSOR INFORMATION. FOR EXAMPLE, VENIK ENGINE NOW APPEARS TO HAVE AT LEAST TWO THRUST CHAMBERS, POSSIBLY HAVING LOWER CHAMBER PRESSURES THAN RD-119 AND RD-107 ENGINE DESIGNS.

3. POTENTIAL GAINS FROM CONUS EXPLOITATION INCLUDE:

A. EXTREMELY LOW COST MANUFACTURING TECHNIQUES COULD BE FULLY DEMONSTRATED TO U.S. INDUSTRY - IMMEDIATE EXPLOITATION POTENTIAL EXISTS.

B. DETAILED MATERIALS COMPOSITION CAN BE OBTAINED. U.K. ANALYSIS MAY NOT BE DEFINITIVE ENOUGH TO DEFINITELY ESTABLISH MATERIAL COMPOSITIONS AND CHARACTERISTICS.

C. PRECISION FORMING METHODS CAN BE ESTABLISHED AND CONFIRMED.

D. WELD QUALITY OF FUSION AND RESISTANCE WELDING CAN BE ESTABLISHED. X-RAYS OF JOINTS AND STRUCTURE CAN ESTABLISH QUALITY.

E. FIRMLY ESTABLISH ABSENCE OF PRESENCE OF DIFFUSION BONDING TECHNIQUES.

F. OBTAIN POSSIBLE PROPELLANT RESIDUES FOR IDENTIFICATION.

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- G. ADVANCED FABRICATION TECHNIQUE LEVEL CAN BE ESTABLISHED.
- H. OBTAIN EXPERIMENTAL STRUCTURAL DATA.
- I. DETERMINE HYDRAULIC CHARACTERISTICS OF COOLANT CHANNELS.

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- J. ESTABLISH HEAT TRANSFER DESIGN LIMITATIONS.
4. THE DATA GAINED FROM CONUS EXPLOITATION SHOULD ASSIST IN ESTABLISHING PERFORMANCE LIMITATIONS FOR OTHER SOVIET ROCKET ENGINES UTILIZING THE EXHIBITED DESIGN CHARACTERISTICS. THESE LIMITATIONS ARE VITAL IN THE ASSESSMENT OF FUTURE SOVIET ROCKET ENGINE TECHNOLOGY ADVANCES. 5. IT IS REITERATED THAT THE NEPAL MOONDUST ITEMS HAVE PRESENTED A UNIQUE OPPORTUNITY FOR STUDY OF SOVIET ROCKET ENGINE DESIGN AND FABRICATION METHODS. THIS OPPORTUNITY IS NOT AVAILABLE FROM SOVIET DISPLAY ENGINES SUCH AS THOSE OBSERVED IN PARIS AND ROME. IT IS DIFFICULT TO PREDICT WHEN ANOTHER IMPORTANT MOONDUST HARDWARE ITEM WILL BE MADE AVAILABLE TO THE INTELLIGENCE COMMUNITY BY WHICH "BENCH MARK" CONTRIBUTIONS TO SPACE, PROPULSION, AND MANUFACTURING TECHNOLOGIES SUCH AS PROVIDED BY THE NEPAL ITEMS, WILL BE AFFORDED. 6. THEREFORE, IT IS RECOMMENDED THAT CONTINUED EFFORTS BE MADE TO ACQUIRE THE ITEMS FOR CONUS

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EXPLOITATION. ONE OF THE NOZZLE PIECES COULD BEST BE UTILIZED FOR THIS EXPLOITATION. IF THE COMPLETE ITEM CANNOT BE OBTAINED, A MINIMUM NEED WOULD BE FOR 5 BY 6 INCH SECTIONS CUT FROM THE MANIFOLD END AND THROAT REGION OF THE NOZZLE. HOWEVER, CONUS

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EXPLOITATION TECHNIQUES ON THE COMPLETE ITEM ARE PREFERABLE IN ORDER TO MINIMIZE EVIDENCE OF THE EESACTIVE SAMPLING OF THE ITEMS. GP-3.

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