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HQ AFSC KIRTLAND AFB NM//CV//

ALSAFECOM 001/1997

ZEN HQ USAF KIRTLAND AFB NM//SE//

ZEN 377ABW KIRTLAND AFB NM//SEG//

ZEN 150FW KIRTLAND AFB NM//SEG//

ZEN HQ AFSC KIRTLAND AFB NM//SEG//

ZEN HQ AFOTEC KIRTLAND AFB NM//SE/SEG//

ZEN 58SOW KIRTLAND AFB NM//SE/SEG//

ZEN PL KIRTLAND AFB NM//SE/SEG//

ZEN HQ AFSFC KIRTLAND AFB NM//SPLT//

INFO HQ USAF WASHINGTON DC//SEI//

COMNAVSAFECEN NORFOLK VA//CODE 40//

CDRUSASC FORT RUCKER AL//CSSC-Z//

CMC WASHINGTON DC//SD//

COMDT COGARD WASHINGTON DC//G-KSE//

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SUBJ: ALSAFECOM 001/1997 - FIRE HAZARD WITH PORTABLE OXYGEN BOTTLE

1. IN THE PAST 18 MONTHS, THERE HAVE BEEN 5 FLASH FIRES INVOLVING WORKERS SERVICING PORTABLE OXYGEN BOTTLES. THE PURPOSE OF THIS MESSAGE IS TO HIGHLIGHT PROBLEMS ASSOCIATED WITH REFILLING

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WALK-AROUND OXYGEN BOTTLES AND POSSIBLE DEFECTIVE PARTS ON SOME OF THE BOTTLES.

2. TWO RECENT INCIDENTS OCCURRED WHILE WORKERS WERE CHARGING AIRCRAFT WALK-AROUND OXYGEN BOTTLES FROM A LARGE COMPRESSED OXYGEN CYLINDER. IN THE FIRST INCIDENT, A WORKER HAD DIFFICULTY CONNECTING A PORTABLE BOTTLE TO THE LINE FROM THE LARGE CYLINDER USING THE QUICK DISCONNECT. AS THEY WERE FORCIBLY CONNECTED, THERE WAS A LOUD POP AND THE QUICK DISCONNECT BEGAN SHOOTING SPARKS. ANOTHER WORKER TURNED OFF THE OXYGEN AT THE CYLINDER VALVE AND THE SPARKING STOPPED. EXTENSIVE BURN DAMAGE TO THE QUICK DISCONNECT ALLOWED OXYGEN TO CONTINUE TO FLOW, INCREASING THE POTENTIAL OF FIRE REACHING OXYGEN IN THE LINE OR CYLINDER AND CAUSING A CATASTROPHIC EXPLOSION. SOURCE OF IGNITION IS UNKNOWN AND UNDER INVESTIGATION. THE SECOND INCIDENT WAS A REPORTABLE CLASS C MISHAP. A WORKER RECEIVED BURNS TO HER NECK, FACE, AND BOTH HANDS AS SHE ATTEMPTED TO REFILL A PORTABLE WALK-AROUND BOTTLE. THIS WORKER WAS ATTEMPTING TO JOIN THE CHARGING VALVE WITH THE CORE ASSEMBLY A SECOND TIME BECAUSE SHE DID NOT FEEL SHE HAD A GOOD CONNECTION DURING THE FIRST ATTEMPT. AS SHE MADE THE SECOND ATTEMPT TO CONNECT THE CHARGING VALVE TO THE CORE ASSEMBLY, A FLASH FIRE OCCURRED SPRAYING SPARKS AND FLAMES OVER HER HAND AND FRONTAL

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AREA.

3. INFORMATION PROVIDED IN SUBJECT REPORTS AND INFORMATION PROVIDED FROM OTHER UNITS AS WELL AS OTHER BRANCHES OF SERVICE, HIGHLIGHT THE FACT THAT MOST OF THESE FIRES WITH OXYGEN BOTTLES OCCURRED DURING CHARGING OPERATIONS. ALSO, THERE WAS NO COMMON ELECTRICAL GROUND, THE EQUIPMENT USED TO PROVIDE CHARGING PRESSURE WAS LEFT PRESSURIZED DURING CONNECTION, NO PRECONNECTION CLEANING WAS ACCOMPLISHED, AND THE OPERATORS HAD NOT WASHED THEIR HANDS IMMEDIATELY PRIOR TO HANDLING THE EQUIPMENT. IN-HOUSE PROCEDURES FOR HANDLING OXYGEN CYLINDERS CAN HELP PREVENT HAZARDS ASSOCIATED WITH SUBJECT BOTTLES.

4. FOR A FIRE TO TAKE PLACE, THREE THINGS MUST BE PRESENT: OXIDIZER, FUEL, AND INITIATOR. IF YOU ELIMINATE ONE OR MORE OF THESE ELEMENTS, YOU WILL SIGNIFICANTLY REDUCE THE CHANCE OF FIRE. THE OXIDIZER (OXYGEN) OBVIOUSLY CAN NOT BE ELIMINATED, THEREFORE FUEL (CONTAMINATION FROM HANDS/ENVIRONMENT) AND INITIATORS (FRICTION WITH MECHANICAL CONNECTORS) MUST BE ELIMINATED. THE MECHANICAL ENGINEERING SECTION OF THE SYSTEM ENGINEERING BRANCH, TINKER AFB, OK, PROVIDED SOME RECOMMENDATIONS TO REDUCE THE PROBABILITY OF A FLASH FIRE BY REDUCING THE FUEL AND INITIATORS. PLEASE NOTE THE FOLLOWING:

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A. THE CHARGING APPARATUS SHOULD HAVE ONE CONFIGURATION WITH ADAPTERS MADE FOR DIFFERENT APPLICATIONS. OFTEN CHARGING EQUIPMENT IS USED WITH PRESSURE REGULATORS AND FILTERS MISSING OR INOPERATIVE. HISTORICALLY, MOST FIRES ON AIRCRAFT OR IN BACK SHOPS OCCUR DURING OR SHORTLY AFTER MAINTENANCE ACTIONS. IT IS JUST AS IMPORTANT TO PROPERLY MAINTAIN THE CHARGING EQUIPMENT AS IT IS TO MAINTAIN THE BREATHING EQUIPMENT.

NOTE: THIS DOES NOT MEAN ALL CHARGING APPARATUS MUST BE THE SAME. WHEN AN APPARATUS IS SET UP FOR CHARGING, IT SHOULD BE LEFT IN THE CONFIGURATION ESTABLISHED. IF THE SETUP NEEDS TO BE CHANGED TO ALLOW USE FOR SOME OTHER APPLICATION, THE ADAPTATION SHOULD BE DONE WITH PLUG-IN ADAPTERS RATHER THAN BY CHANGING VALVES, FITTINGS, AND REGULATORS FOR THE NEW APPLICATION. CHANGING COMPONENTS OPENS THE DOOR FOR LEAKS, METAL PARTICLES FROM THREADS AND CONTAMINATION.

B. TOOLS, EQUIPMENT, AND WORK AREA SHOULD BE DEDICATED TO ONLY OXYGEN EQUIPMENT. THE EQUIPMENT BEING SERVICED SHOULD LIKEWISE BE KEPT CLEAN ESPECIALLY AT MATING SURFACES. ORGANIZATIONS MUST OBTAIN APPROVAL AND CAUTIONS FOR USE OF SOLVENT CLEANERS FROM THEIR LOCAL HEALTH AND ENVIRONMENTAL OFFICES. THE USE OF ISOPROPYL ALCOHOL IS SPECIFICALLY NOT RECOMMENDED. MOST HAND LOTIONS ARE NOT COMPATIBLE

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WITH OXYGEN AND SHOULD BE THOROUGHLY REMOVED PRIOR TO HANDLING EQUIPMENT, OR PROTECTIVE GLOVES SHOULD BE USED TO ISOLATE CONTACT. THE MEDICAL STAFF RECOMMENDED USE OF FIRE RETARDANT GLOVES SUCH AS NOMEX FLIGHT GLOVES AS A REQUIRED ITEM -- PROVIDED THIS DOESN'T REQUIRE A LOT OF DEXTERITY. EYE AND FACE PROTECTION, SUCH AS A CLEAR FACESHIELD, SHOULD BE STANDARD PROTECTIVE EQUIPMENT.

C. PROPER SETUP OF SERVICING EQUIPMENT IS DETAILED IN T.O.15X-1-1 SECTION 6. SUCH PRACTICES AS LEAVING THE SYSTEM CHARGED TO RATED PRESSURE PRIOR TO CONNECTING TO THE PORTABLE OXYGEN SYSTEM WOULD BE IN DIRECT CONFLICT WITH PROPER PROCEDURES. REASONING FOR NOT CONNECTING WITH LINE PRESSURE IS THAT WITH THE EXTRA FORCE REQUIRED TO MAKE THE CONNECTION, THE CHANCES FOR GALLING THE METAL EXPOSING FRESH STEEL OR ALUMINUM TO THE OXYGEN FLOW MAKE AN OXYGEN-FED FIRE HIGHLY LIKELY. DAMAGE TO THE FITTINGS IS DIFFICULT TO PREVENT AND METAL PARTICLES AS WELL AS LEAKS MAY EVENTUALLY DEVELOP, INCREASING THE RISK FOR AN OXYGEN FIRE. THE T.O. ALSO CAUTIONS TO FOLLOW THE ELECTRICAL BONDING REQUIREMENTS OF T.O.00-25-172. THESE REQUIREMENTS ARE NOT ARBITRARY, BUT HAVE BEEN DEVELOPED OVER TIME IN RESPONSE TO PREVIOUS INCIDENTS.

D. THE MOST SIGNIFICANT SUGGESTION THAT CAN BE MADE IS TO INCREASE

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TRAINING.

5. UNITS UTILIZING OXYGEN REGULATORS SHOULD IMMEDIATELY INSPECT THEM FOR VISIBLE CONTAMINATION AND GENERAL CONDITION. REMOVE DAMAGED OR CONTAMINATED REGULATORS FROM SERVICE UNTIL THEY CAN BE REPLACED OR REPAIRED. REVIEW PROCEDURES TO ENSURE ALL OXYGEN HANDLING EQUIPMENT IS KEPT CLEAN AND TOTALLY FREE OF GREASE AND OIL, INCLUDING OIL FROM HANDS. ALSO, REVIEW LOCAL PROCEDURES FOR SERVICING PORTABLE OXYGEN BOTTLES TO ENSURE SERVICING IS BEING ACCOMPLISHED IN THE SAFEST MANNER POSSIBLE.

6. THE ITEM MANAGER FOR THESE PORTABLE OXYGEN BOTTLES, IS AWARE OF THIS PROBLEM AND WORKING WITH OTHER ENGINEERS TO DESIGN A DIFFERENT TYPE OF QUICK DISCONNECT THAT WILL ADDRESS THE POSSIBLE PROBLEM WITH THE MATERIALS THE CONNECTORS ARE MADE OF. THE ITEM MANAGER WILL KEEP THE SAFETY CENTER POSTED ON THE DEVELOPMENTS OF THIS ITEM.

7. ALSO, UNITS WITH LIFE SUPPORT PRODUCT MODELS A270-020 AND L270-050 REGULATORS SHOULD CONTACT THE MANUFACTURER AT (800)231-5273 TO RECEIVE A FREE FILTER REPLACEMENT KIT DESIGNED TO LESSEN THE CHANCE OF CONTAMINATION.

8. ALL ADDRESSEES PLEASE NOTE THAT TWO GIDEP SAFE ALERTS (G7-S-91-01 AND G7-S-94-1) WERE PUBLISHED AS A RESULT OF PROBLEMS

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ENCOUNTERED WITH VALVES WHERE COMPRESSION HEATING AND PARTICLES  
IMPACT INITIATE THE FIRE EXPLOSION. THESE TWO ALERTS PROVIDE  
GUIDANCE AND RECOMMENDED REPLACEMENT PARTS FOR APPLICABLE OXYGEN  
EQUIPMENT. COPIES OF SAFE ALERTS CAN BE PROCURED THROUGH THE  
AERONAUTICAL SYSTEMS CENTER, 2530 LOOP ROAD WEST, WRIGHT  
PATTERSON AIR FORCE BASE, OH, 45433-7101. DSN NUMBER IS 785-7953 AND  
COMMERCIAL NUMBER IS (513)255-7953. FAX NUMBER IS DSN 785-8063.  
9. THE HQ AFSC/SEGO POC FOR SUBJECT ALSAFECOM IS CMSGT HICKS OR MR.  
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