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SECTION 1

1a. DOCUMENT IDENTIFICATION

TITLE Hazardous Waste Associated With Space Launch Operations: Hypergolic Vapors and Liquids		AUTHOR(S) Kurt Kessel	
POINT OF CONTACT (If different from author) Kurt Kessel	E-MAIL kurt.r. kessel@nasa.gov	ADDRESS Mail Stop: ITBINC Kennedy Space Center, FL 32899	
COTR OR CENTER-DESIGNATED OFFICIAL Chuck Griffin	E-MAIL chuck. griffin@nasa.gov	ADDRESS KT-A2 Kennedy Space Center, FL 32899	
ORIGINATING NASA CENTER AND ORGANIZATION KSC		PERFORMING NASA CENTER AND ORGANIZATION (If different)	
CONTRACT NUMBER NAS10-03029	GRANT NUMBER	INTERAGENCY NUMBER	OTHER DOCUMENT NUMBER(S) KSC-2009-253

1b. TYPE OF STI

<input type="checkbox"/> ABSTRACT <input type="checkbox"/> BOOK NAME OF PUBLISHER: <input type="checkbox"/> CONFERENCE PAPER <input checked="" type="checkbox"/> CONFERENCE PRESENTATION CONFERENCE NAME/SPONSOR: 2009 C3P - NASA International Workshop on Environment and Alternative Energy CONFERENCE LOCATION: Munich, Germany DATES: <u>11/10/2009</u> TO: <u>11/12/2009</u> <input type="checkbox"/> ORAL/VISUAL PRESENTATION ADDITIONAL INFORMATION: <input type="checkbox"/> NASA STI SERIES REPORT (See NPR 2200.2) <input type="checkbox"/> TECHNICAL PUBLICATION (TP) <input type="checkbox"/> TECHNICAL MEMORANDUM (TM) <input type="checkbox"/> CONTRACTOR REPORT (CR) <input type="checkbox"/> CONFERENCE PUBLICATION (CP) <input type="checkbox"/> SPECIAL PUBLICATION (SP) <input type="checkbox"/> TECHNICAL TRANSLATION (TT)	<input type="checkbox"/> DOCUMENT FOR PUBLIC WEB SITE (Must meet requirements in NPR 2810.1, chapter 11, for publishing on the Internet) <input type="checkbox"/> DOCUMENT FOR INTERNAL NASA WEB SITE URL: http://www.teerm.nasa.gov PERSISTENT URL (If applicable): <input type="checkbox"/> OTHER (Periodical, format, etc.) <input type="checkbox"/> JOURNAL ARTICLE JOURNAL NAME/PUBLISHER: <input type="checkbox"/> IF A PREPRINT (draft or revision being sent to journal), DO YOU WANT IT DISSEMINATED TO: <input type="checkbox"/> ONLY THE PUBLISHER <input type="checkbox"/> NASA AND ITS CONTRACTORS <input type="checkbox"/> US GOVERNMENT AGENCIES AND THEIR CONTRACTORS <input type="checkbox"/> PUBLIC <input type="checkbox"/> IF A REPRINT (article published by journal) BEING SENT TO NASA CENTER FOR AEROSPACE INFORMATION TO ADD TO STI DATABASE, DID YOU GET PERMISSION FROM THE PUBLISHER TO DISTRIBUTE TO PUBLIC? <input type="checkbox"/> YES (Attach copy of permission) <input type="checkbox"/> NO
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NAME Kurt Kessel <i>Kurt Kessel</i>	ORG CODE KT-A2	E-MAIL kurt.r.kessel@nasa.gov	DATE 9/29/09
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7. NASA PROJECT OFFICIAL (COTR/designated official, or Technical Monitor) / DIVISION CHIEF REVIEW OF 1 THROUGH 6

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REASON: _____

NAME Chuck Griffin <i>Chuck Griffin</i>	TITLE Manager, TEERM	E-MAIL chuck.griffin@nasa.gov	DATE 9/28/09
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CENTER/HQ EXPORT CONTROL ADMINISTRATOR NAME <i>Melanie R. Chan</i>	E-MAIL melanie.r.chan@nasa.gov	DATE 9-29-09
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REPORT DOCUMENTATION PAGE

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1. REPORT DATE (DD-MM-YYYY) 29-09-2009		2. REPORT TYPE Power Point Slides		3. DATES COVERED (From - To) October 2008 - September 2009	
4. TITLE AND SUBTITLE Hazardous Waste Associated With Space Launch Operations: Hypergolic Vapors and Liquids				5a. CONTRACT NUMBER NAS10-03029	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
				5d. PROJECT NUMBER	
6. AUTHOR(S) Kurt Kessel				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
				8. PERFORMING ORGANIZATION REPORT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) NASA Technology Evaluation for Environmental Risk Mitigation Principal Center - Kennedy Space Center, FL - Mail Stop: ITBINC				10. SPONSOR/MONITOR'S ACRONYM(S) NASA-TEERM	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) NASA Technology Evaluation for Environmental Risk Mitigation Principal Center - Kennedy Space Center, FL - KTA2				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
				12. DISTRIBUTION/AVAILABILITY STATEMENT Available to Public	
13. SUPPLEMENTARY NOTES					
14. ABSTRACT In response to concerns about risks from lead-free induced faults to high reliability products, NASA has initiated a multi-year project to provide manufacturers and users with data to clarify the risks of lead-free materials in their products. The project will also be of interest to component manufacturers supplying to high reliability markets. The project was launched in November 2006. The primary technical objective of the project is to undertake comprehensive testing to generate information on failure modes/criteria to better understand the reliability of: - Packages (e.g., TSOP, BGA, PDIP) assembled and reworked with solder interconnects consisting of lead-free alloys - Packages (e.g., TSOP, BGA, PDIP) assembled and reworked with solder interconnects consisting of mixed alloys, lead component finish/lead-free solder and lead-free component finish/SnPb solder					
15. SUBJECT TERMS Lead-Free, Pb-Free					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 18	19a. NAME OF RESPONSIBLE PERSON Kurt Kessel
a. REPORT U	b. ABSTRACT U	c. THIS PAGE U			19b. TELEPHONE NUMBER (Include area code) 321-867-8480