

Range UDS Documentation

# Range Safety Operations Requirement No. 19 for Toxic Hazard Control – Daily and Launch Operations, Revision A

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17 February 2009

Contract FA2521-07-C-0011

Prepared for:



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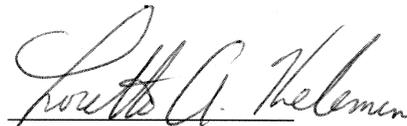
45TH SPACE WING/EASTERN RANGE  
RANGE SAFETY RISK ASSESSMENT CENTER (RAC)  
DAILY AND LAUNCH OPERATIONS REQUIREMENT  
REVISION A

17 February 2009

SUPPLEMENTS AFSPCMAN 91-710, 01 JULY 2004 (1<sup>st</sup> set of paragraph numbers) AND EWR 127-  
1, 31 OCT 1997 (2<sup>nd</sup> set of paragraph numbers)  
SUPPORTS ALL VEHICLES LAUNCHED FROM KSC OR CCAFS, AND DAILY SUPPORT

SUPPORTED FROM THE MORELL OPERATIONS CENTER (MOC)

APPROVED:



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10.6 (3.10.6) Hazard Control

10.6.1 (3.10.6.1) Video Output Requirements

10.6.1.1 (3.10.6.1.1) Video output of computer screens from the Risk Assessment Center (RAC) is required for both Daily Support and Launch Operations. Mission specific video shall start no later than L-6 hours to all applicable firing rooms, and emergency operation centers (both on-base and off-base). Once established, channel numbers may be changed only if appropriate notification is given to RAC personnel and affected sites.

10.6.1.2 (3.10.6.1.2) Video output is required to be available to the Brevard Emergency Management Center (BEMC) as a Daily Support and Launch Operations Requirement. This output shall be as selected at the Cape Canaveral Television (CCTV) switch at the BEMC representative console.

10.6.2 (3.10.6.2) Software Requirements. Rocket Exhaust Effluent Diffusion Model (REEDM) Version 7.13, Launch Area Toxic Risk Assessment (LATRA) Version latra-j3, Ocean Breeze-Dry Gulch (OB-DG), Hybrid Particle and Concentration Transport (HYPACT), Regional Atmospheric Modeling System (RAMS), Blast Distant Focusing Overpressure (BlastDFO), facility Damage and Personnel injury (DAMP), Monte Carlo Launch Area Risk Assessment (MCLARA), Range Risk Assessment Tool (RRAT) are required as a Daily Support Requirement.

10.6.3 (3.10.6.3) Hardware Requirements. The following hardware is required to be continuously operational: Eastern Range Dispersion Assessment System (ERDAS). This equipment shall be fully functional as a Daily Support and Launch Operations Requirement.

10.6.4 (3.10.6.4) Audio Communications Requirements:

10.6.4.1 (3.10.6.4.1) Should be provided to consoles M8-19 IAW vehicle/mission specific ODs.

10.6.4.2 (3.10.6.4.2) Telephone service external to the MLP-3. All administrative phones are a daily operations requirement and are required for Class A incoming/outgoing touch-tone service with FTS and DSN capability.

10.6.4.2.1 (3.10.6.4.2.1) External administrative telephones to the MLP-3. The phone lines are as follows:

	M14	M15	M10	M19	M12	M13	M8	M9
External	3-8439	3-8440	3-8418	3-8417	3-8474	3-8443	3-8279	3-8242
MLP-3	3-2084	3-2085	3-8007	3-8095	3-2034	3-8008	3-2169	3-2170

10.6.4.2.2 (3.10.6.4.2.2) Fax lines. The following fax line number has been provided to numerous governmental and outside agencies and therefore must not be changed: FAX 853-8153

10.6.4.2.3 (3.10.6.4.2.3) Additional BEMC Console M13 telephone service requirements are as follows:

- a. Direct voice must be provided from RAC number 730-0188 to BEMC number 638-0411.

10.6.5 (3.10.6.5) Meteorology:

10.6.5.1 (3.10.6.5.1) Upper air rawinsonde balloon data files are required to be provided as soon as possible for all rawinsondes released. This data is required to be provided via Meteorological Interactive Data Display System (MIDDS) for analysis within the RAC.

10.6.5.2 (3.10.6.5.2) Daily Loads Requirements: Rawinsondes are required daily at 0600L and 1800L every day including weekends. Furthermore, April through October, an additional daily balloon is required at 1100L. These balloons shall provide data up to termination for every 1000 feet of altitude plus mandatory and significant levels.

10.6.5.3 (3.10.6.5.3) Mission Specific Requirements: Daily balloons may be supplemented with balloons required to fulfill specific missions. Should these mission specific balloons provide sufficient upper air coverage, these balloons may be used in lieu of the daily balloons described above. The ERTS Meteorological Systems Coordinator shall provide schedules for mission specific balloons to the RAC at least two days prior to each mission.

10.6.5.3.1 (3.10.6.5.3.1) On launch day balloons that are required to fulfill specific mission requirements shall be first transmitted to the RAC when the balloon reaches 20,000 feet Above Ground Level (AGL). These balloons shall provide data up to termination for every 1000 feet of altitude plus mandatory and significant levels. First transmission of launch day mission specific balloon data is required within 25 minutes of each release.

10.6.5.4 (3.10.6.5.4) Contingency Requirements: Should meteorological variability, accident probability, or potential severity warrant, Range Safety shall require rawinsonde contingency releases. Contingency releases shall be requested only when necessary to protect public or personnel safety and shall be coordinated with the ERTS Meteorological Systems Coordinator to minimize weather station personnel strain, other upper air data customer impacts, and range cost.

10.6.5.4.1 (3.10.6.5.4.1) Contingency balloon releases may be requested by Range Safety to support range customer requests, Launch Disaster Control Group pre-launch positioning, launch commit decisions, and emergency responses. When requested, various contingency rawinsondes can be released as follows: every 30 minutes to 20,000 feet AGL with a transmittal time of 25 minutes from release; every 15 minutes to 10,000 feet AGL with a transmittal time of 15 minutes from release; or every 10 minutes to 6,000 feet with a transmittal time of 10 minutes from release. These balloons shall provide data for every 1000 feet of altitude plus mandatory and significant levels.

10.6.5.5 (3.10.6.5.5) User directed rawinsonde schedules, although not a Range Safety requirement, have previously been found to be compatible with Range Safety Risk Assessment Center hazard control requirements as well as with other upper air balloon users. The Range Safety rawinsonde requirements most often are encompassed by these requirements from other users, and if the above listed requirements are met, additional balloons are not required for the Range Safety programs.

10.6.5.6 (3.10.6.5.6) 45 WS atmospheric launch day forecast requirements supporting toxic dispersion analyses are listed below. A certified forecaster is required to perform this function. This support is only required for launch vehicles that can pose a toxic risk to on-base/off base personnel.

10.6.5.6.1 (3.10.6.5.6.1) Launch day T-0 forecasting is required for every rawinsonde released inside of T-6 hours until it is determined that the forecast is merging with the observed.

10.6.5.6.2 (3.10.6.5.6.2) T-0 forecast of wind speed and direction, pressure, humidity, and air temperature at surface up to 10 kft at 1000 ft increments plus mandatory and significant data, height of cloud ceiling in meters, cloud sky coverage in tenths, height of the mixing layer (inversion height) and observed turbulence measurements.

10.6.7 (3.10.6.7) Operational Commit Criteria: The following criteria are applicable to control of toxic dispersion, distant focusing overpressure, and debris hazards to acceptable public and personnel risk levels for all 45 SW operations.

10.6.7.1 (3.10.6.7.1) See AFSPCMAN 91-710 (EWR 127-1), volume I for expectation of casualty criteria, both collective ( $E_c$ ) and individual ( $P_c$ ), for the various population categories as defined in AFSPCMAN 91-710 (EWR 127-1).

10.6.7.2 (3.10.6.7.2) When AFSPCMAN 91-710 (EWR 127-1), volume I criteria is exceeded the Eastern Range Safety office will recommend a "Red" condition for the operation/launch. This recommendation will remain in effect until a waiver has been processed, or conditions change so as to reduce the calculated risk below the established criteria.

10.6.8 (3.10.6.8) Toxicity Levels:

10.6.8.1 (3.10.6.8.1) For operations involving exposures to toxicants of personnel in Potential Hazard Corridors (PHC)/Effective Hazard Corridors (EHC) a tiered approach will be applied as a function of Acute Exposure Guidance Level (AEGL); BEMC coordinated Level of Concern (LOC), facility protection factor, affected agency's response capability, probability of occurrence, and potential severity.

10.6.8.2 (3.10.6.8.2) For toxic propellant or combustion by-products, a range should prevent exposure to personnel in PHC/EHC to concentrations above the level of concern (LOC) or equivalent established by the U.S Environmental Protection Agency (EPA), Federal Emergency Management Agency (FEMA), Occupational Safety and Health Administration (OSHA), National Institute of Occupational Safety and Health (NIOSH) of the Centers for Disease Control (CDC), the American Conference of Government Industrial Hygienists (ACGIH), or Department of Transportation (DOT) unless an EPA Acute Emergency Guidance Level (AEGL) exists for a toxicant that is more conservative than the LOC (that is, lower after reduction for duration of exposure). If an LOC has not been established, the range should demonstrate that exposure at the proposed toxic concentration threshold will not cause a casualty.

Concentration	Action	PHC/EHC Status	
		On Base	Off Base
Below AEGL-1 for commodity of concern.	None	G R E E N	G R E E N
Above AEGL-1 but below AEGL-2 for commodity of concern.  Below AFSPCMAN 91-710, vol. I criteria.	(Tier 1)  Notify affected authorities: CCAFS/KSC/BEMC  Take mitigation actions:  Recommend "Green" for operation/launch		
Above AEGL -2 but below AEGL-3 for commodity of concern.  Below AFSPCMAN 91-710, vol. I criteria	(Tier 2)  ONBASE: (In corridor) Clear unhealthy Shelter in corridor: $C_i \text{ max} = \text{LOC, goal AEGL}$ $C_i = C_o [1 - \exp(-kt/60)]$ Recommend hold if $C_o, t$ exceed $C_i \text{ max}$  OFFBASE: Coordinate risk assessment with BEMC. Hold unless mitigating actions can be implemented prior to plume arrival.	G C* R O E N E D N I T I O N A L	G C* R O E N E D N I T I O N A L
Above AFSPCMAN 91-710, vol. I criteria	(Tier 3)  ONBASE: Recommend relocation of personnel in the corridor who are exceeding criteria, or process a waiver.  OFF-BASE: Remain in a "Red" condition until a waiver has been processed.	G C* R O E N E D N I T I O N A L	R E D

Conditional\* = "Red" unless appropriate actions above are fulfilled.