

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT ID CODE	PAGE OF PAGES 1
2. AMENDMENT/MODIFICATION NO. 3	3. EFFECTIVE DATE 02/21/2013	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
6. ISSUED BY CODE	PS32-B	7. ADMINISTERED BY (If other than Item 6) CODE	PS32-B
Procurement Office George C. Marshall Space Flight Center National Aeronautics and Space Administration Marshall Space Flight Center, AL 35812		John Busbey/256.544.0896 FAX 256.544.9162 Email: john.a.busbey@nasa.gov	
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State, and Zip Code)		AUTOMATED INVOICE PAYMENT INFORMATION: (256) 544-5566	
		(x)	9A. AMENDMENT OF SOLICITATION NO. NNM13ZPS001E
		X	9B. DATED (SEE ITEM 11) 01/25/2013
			10A. MODIFICATION OF CONTRACT/ORDER NO.
			10B. DATED (SEE ITEM 13)
CODE	FACILITY CODE		

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

X The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers X is extended, is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

- (a) By completing Items 8 and 15, and returning _____ copies of the amendment;
- (b) By acknowledging receipt of this amendment on each copy of the offer submitted;
- (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(x)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor is not, X is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

PROJECT: IDIQ Construction.

The purpose of this amendment is to answer questions and make clarifications to the solicitation.

The due date for receipt of Proposal: See Section 13A page 1 of SF1442 , due date is changed to read 3:30 p.m. local time March 4, 2013.

All terms and conditions of the solicitation remain the same.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)	
		John Busbey	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
(Signature of person authorized to sign)		BY Original signed by	02/21/2013
		(Signature of Contracting Officer)	

Amendment 3, IDIQ Construction
Questions and Answers

1. Can a partial Volume II be submitted early or submit a completed Volume II and Volumes I and IV on bid day?

1. Response: All materials must be received as stated in the solicitation.

2. Please confirm that the proposal consists of one binder with three sections: Price, Past Performance & Safety, and Completed RFP.

2. Response: You may use whatever is necessary to comply with the solicitation.

3. Does MSFC have a standard template for the Price Proposal or should the Offeror comply in own format to the P. 51 description of Part I – Price Proposal?

3. Response: Please comply with the requirements of the solicitation.

4. Please confirm that offerors are to send a completed FAX Request to each PP reference, who will use it to fax the completed PPQ back to the Government.

4. Response: Please complete per the instructions in the solicitation.

5. Link provided on page 53 to MPR 8715.1 / MSFC SHE not working – please provide correct link or the Document.

5. Response: Page 53 delete website reference in last sentence under **Safety, Health and Environmental (SHE) Plan** first paragraph. MPR 8715.1 is attached.

6. Where are the SF1442 and Reps/Certs to be placed in the proposal? Page 51 lists them under Part I requirements; Page 54 lists the SF1442 in Volume IV which would put the 1442 at the end of the proposal.

6. Response: We will accept in either location.

7. Page 53 references a Safety, Health, & Environmental Plan. Page 55 references a Health and Plan. Is this one and the same document or are these 2 separate documents? And are the plan(s) to be written as project-specific for the seed project?

7. Response: One plan is required, the reference on page 53 under Safety, Health and Environmental (SHE) Plan, paragraph one the NFS should read NFS 1852.223-73, which is the same as L.15 on page 55. Plans are to be written accord to the clause listed.

8. We were a bit confused on what was meant under the requirement for Vol IV Completed RFP & Signed SF1442.

8. Response: Please refer to Section L.11 PART I- PRICE PROPOSAL: complete per the solicitation requirements.

9. Section K. Do we fill this hard copy out and return as part of our bid package?

9. Response: Please refer to Section L.11 PART I- PRICE PROPOSAL: complete per the solicitation requirements.

9A. Also, it references ORCA. ORCA and CCR are now SAM. We've completed our annual SAM Registration. How do we need to address this aspect of the Solicitation?

9A. Response: Please refer to Section L.11 PART I- PRICE PROPOSAL: complete per the solicitation requirements. ORCA and CCR are now included in SAM.

Amendment 3, IDIQ Construction
Questions and Answers

10. The solicitation also states that safety information is requested for any applicable subcontractors proposed in the effort. Are you asking for a draft safety plan from subcontractors, or just the subcontractors EMR? If you are asking for a draft safety plan from subs, what are you considering “applicable” subcontractors?
- 10. Response:** Under Safety, Health and Environmental (SHE) Plan, please delete the sentence that states “This information is also requested for any applicable subcontractor proposed in this effort”.
11. Construction durations for the two seed projects have not been provided. Also, are there any liquidated damages for the seed projects?
- 11. Response:** The duration for the project is 100 calendar days after notice to proceed. No liquidated damages are contained within this project.
12. Will the customer will be responsible for moving the stuff in bldg 4605 to allow us access to the ceiling to run the piping. As I understand it the hallways were pretty full and we just need to know if we should budget extra time to either move the items or work around them.
- 12. Response:** The contractor should plan on moving the items. When it comes to the sensitive lab equipment, there will be some help.
13. According to the chart on page 55 of the RFP, Factor II - Past Performance is limited to 5 pages. We find it challenging to sufficiently detail 5 project examples, as well as offering some narrative in the 5 allotted pages. We would also like to include an organizational chart as well as an introduction to the Trinity/Bhate Joint Venture, as well as explaining the responsibilities of each firm, and verifying the location of our local office. Are we allowed to put this important information in a 2 page cover letter?
- 13. Response:** Page limit contained within the RFP is not changed.
- 13A. Are we allowed to submit CCASS ratings along with the PPQs?
- 13A Response:** You should submit only the requested and required materials in the solicitation.
- 13B. Do you want a detailed proposal for each of the buildings and then indicate the total for both buildings on the SF1442?
- 13B. Response:** YES, this is what we would like to see.
- 13C. Do you want separate project schedules for each or one that shows both projects?
- 13C Response:** We need one that shows both projects.
- 13D. Where are we to discuss the office location as required by para L-21?
- 13D. Response:** Address and include in proposal.
- 13E. We have an existing Corporation Health and Safety Plan (HASP). It is quite a large document. Para L.15 required us to submit the Plan with the proposal. Is that the intent because it appears that is separate from the requirements of para L.11 SHE Plan discussed on page 53. If required is an electronic version of the HASP acceptable.
- 13E. Response:** It is requested that you comply with the requirements of Section L.11 and L.15. It does not appear a corporation Health and Safety Plan will address the requirements listed in L.11 and L.15.
14. For the building 4605 plans, the pump schedule on drawing M1 note #3, directs us to 23 21 23.16. However, there is no pump specification 23 21 23.16 in the TSRC-10. Direction is requested.
- 14 Response:** See attached. Specification 23 21 23.16 is a supplemental specification section and 23 08 00 is an attachment to the 23 08 00 specification section.

Amendment 3, IDIQ Construction
Questions and Answers

15. For the building 4605 plans, should there be a specification section in TSRC-10 for the chiller shown on the "M" drawings?

15 Response: No specification is needed for the air cooled chiller.

16. On Drawing FAC-AE-4605-M4, the riser piping and equipment drop piping sizes schedule indicates (D1, D2, D3, D4). What does this designation reference? Are these areas?

16 Response: D1, D2, D3, and D4 are references to equipment drop piping as seen in the schedule and adjacent piping diagram. They are not a reference to an area. The riser designations in schedule can be located on the floor plan.

17. How long can the main entrance to building 4491 be closed down to replace the two sets of doors?

17 Response: No more than three days

18. Can NASA provide a spec for the card reader to be removed and reinstalled at Building 4491?

18 Response: This work will be done by others.

19. Can we block out a work area inside Building 4491 while working on the two ramps and installing the plumbing in the hallway? Is there another route the users can take to stay out of the construction area?

19 Response: Yes we can find an area and there are other routes out of the building.

20. Can NASA provide a spec or manufacturer for the rubber runner to be installed on interior wood ramps in Building 4491?

20 Response: No, we do not have a manufacturer for the rubber runner.

21. What chiller manufacturers are on the approved list for projects at MSFC?

21 Response: MSFC does not have a list of approved chiller manufacturers.

22. Drawing S1 Building 4605; Enlarged Plan: Note states "Remove existing girts, siding and trim on west side of existing equipment room." During the site walk it was noted that there are plywood panels that are apparently attached to the existing metal building girts and electrical panels attached to this plywood. Drawing E1; Electrical Floor Plan: indicates that there are electrical panels on this wall.

a) Are the plywood panels to be removed?

b) Are the existing electrical panels to be relocated?

c) If the existing electrical panels are to be relocated, where are they to be located?

22 Response: Remove siding and trim.

23. Drawing S1 building 4605; New Addition Layout: Note states "New conc. slab for addition to equip. room. Match exist. floor elevation." During the site walk it was noted that there is a concrete curb along the west wall of the existing equipment room. Is this concrete curb to be removed, along with the girts and siding, to provide a smooth transition from the new addition into the existing equipment room?

23 Response: Curb to Remain.

24. Will the buildings be occupied during construction?

24 Response: Yes

25. Will we be required to protect all of the scientific equipment, furniture, etc. from dust and debris during construction in building 4605?

25 Response: All equipment and furniture to remain in place during construction and shall be protected from damage and debris during construction.

Amendment 3, IDIQ Construction
Questions and Answers

26. Can the interior ramp structures for building 4491 be constructed using light gauge metal framing in lieu of FRT wood framing?

26 Response: Yes, contractor shall submit metal framing detail design at award of project – Provide shop drawings that show proposed construction of metal framing.

27. Drawing A4; Room 107 Building 4491 New Ramp Plan: indicates that the existing door into Room 106 is to be relocated to the east wall. During the site walk it was noted that an electrical panel, 2 thermostats, a humidity sensor/control and a fire alarm device are all mounted at this location. Are we to relocate these in order to install the door or will the door location be changed?

27 Response: See Revised Door Location design below. See below Sketch “Building 4491 Provide ADA Accessibility New Ramp at Room 106 Addendum 1”

28. Drawing A4: Note 6 Building 4491 indicates that the handrail center of the existing stairs is new. Note on the plan indicates that this handrail is to remain existing. Please verify.

28 Response: A4 Note 6 Building 4491 states “Provide new metal stud framing around the new door opening.” The plan (on sheet A5) notes the handrails to remain, but note 6 indicates that all but the east guardrails/handrails are to be new. Only the east guardrail/handrail is to remain. Replace other existing railings with new.

29. Are any of the existing columns for Building 4491 entry structure to be painted?

29 Response: A5 Note 6 paint existing exterior railings and columns to match

30. The existing column at the southwest corner of the Building 4491 landing is 12" from the building wall and into the flow for the new ramp. Will this column need to be relocated?

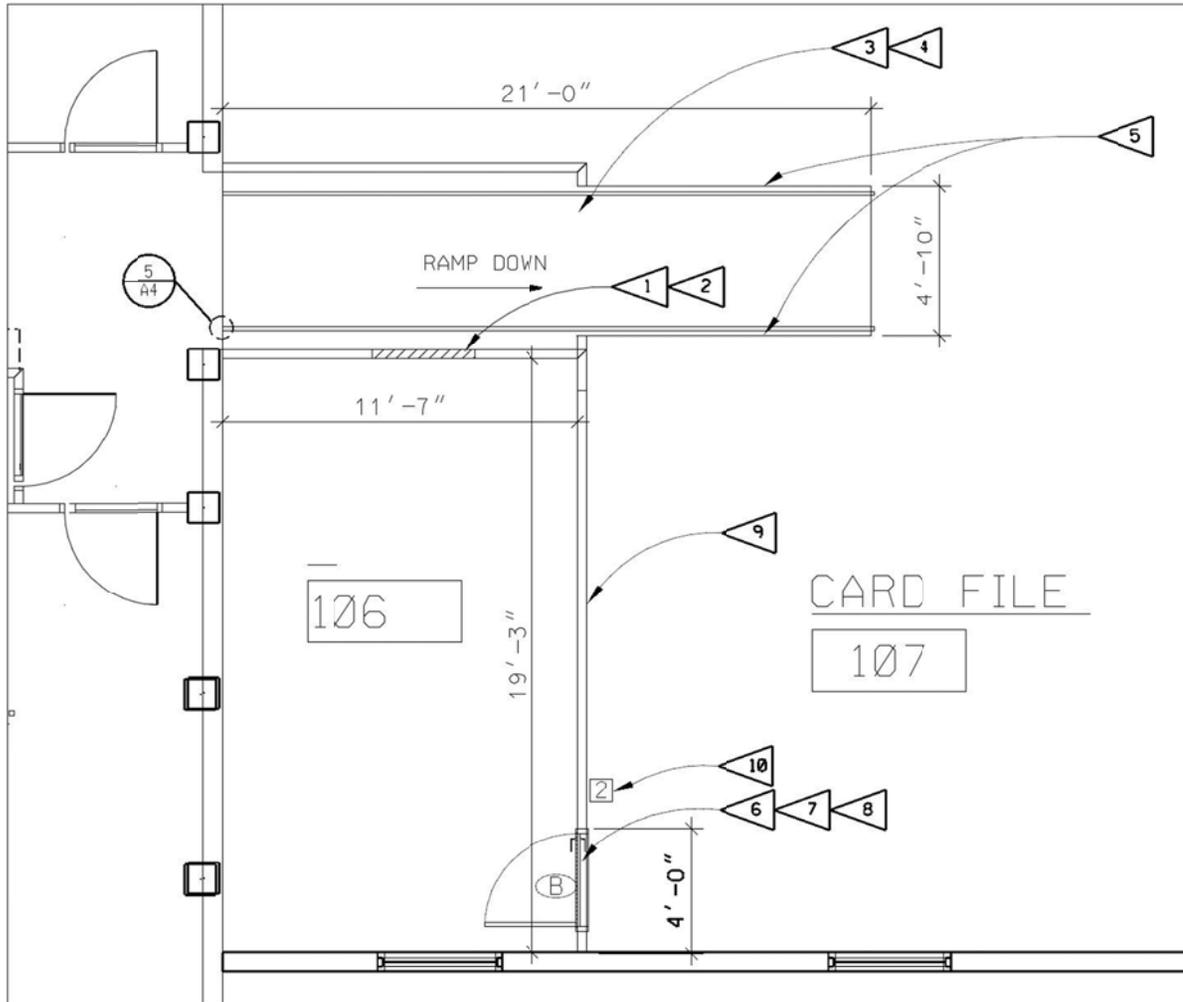
30 Response: Relocate existing column next to building, move south to the area as close to the building as possible. – Replace cap plate with new, fashioned to provide two fasteners on one side of the column to facilitate column’s abutment to existing wall of building.

31. There is a downspout mounted to the column at the southwest corner of the existing landing entering Building 4491. Will this downspout need to be relocated?

31 Response: Remove downspout that is mounted to column that is being moved to the building. Patch gutter after removal with matching metal and seal to existing gutter. Reinstall downspout to the same gutter on the outside most existing column. – I think I would provide a new downspout with a length sufficient to reach the grade. (The existing downspout terminates about 3’ above grade. Also, adjust slope of gutter as required to drain to downspout’s new location.

32. The threshold at the landing into the building has approximately a 2" step up into the building. Will this step need to be removed/adjusted for ADA compliance?

32 Response: Add material at a 1/12 slope to porch to make up the approximate 1” needed to match threshold height. Submit material sample at award of project. See sketch below “RESPONSE TO INQUIRY REGARDING FLOOR ELEVATION ADA COMPLIANCY”



**ROOM 107
ARCHITECTURAL NOTES:**

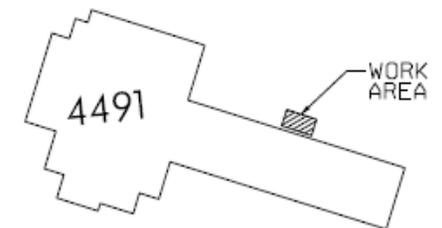
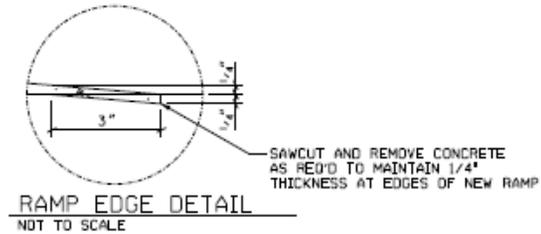
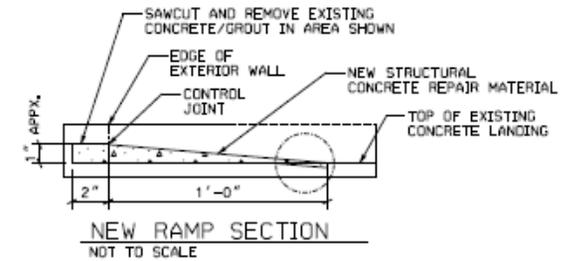
- 1 PROVIDE NEW METAL STUD FRAMING AND GYPSUM BOARD TO ENCLOSE EXISTING OPENING. NEW GYPSUM BOARD SHALL BE FLUSH WITH EXISTING WALL. PATCH, SAND AND REPAIR BOTH SIDES OF WALL WHERE DOOR WAS REMOVED.
- 2 PAINT BOTH SIDES OF NORTH WALL OF ROOM 106. MATCH EXISTING PAINT IN COLOR AND FINISH.
- 3 CONSTRUCT NEW FRT PLYWOOD RAMP. (SEE RAMP PLAN, SHEET A4 AND DETAILS, SHEET A3)
- 4 PROVIDE NEW 1/8" THICK BLACK VINYL ANTI-SLIP MAT GLUED DOWN TO PLYWOOD SURFACE. (SEE DETAILS, SHEET A3)
- 5 INSTALL NEW GUARDRAIL/HANDRAIL ASSEMBLY. (SEE RAMP PLAN, SHEET A4 AND DETAILS, SHEET A3)
- 6 PROVIDE NEW METAL STUD FRAMING AROUND THE NEW DOOR OPENING.
- 7 INSTALL EXISTING 3'-0" X 7'-0" DOOR AND DOOR FRAME TO NEW LOCATION. REUSE EXISTING DOOR HARDWARE AND HINGES.
- 8 PATCH, REPAIR AND PAINT ALL SIDES OF EXISTING DOOR AND DOOR FRAME. MATCH EXISTING PAINTS IN COLOR AND FINISH.
- 9 PATCH, SAND AND REPAIR BOTH SIDE OF EAST WALL. PAINT BOTH SIDES OF WALL. MATCH EXISTING PAINT IN COLOR AND FINISH.
- 10 RELOCATE EXISTING ROOM SIGN TO NEW LOCATION.

ADDITIONAL NOTE FOR CLARIFICATION:
ALL WALL MOUNTED FIRE EXTINGUISHERS IN THE AREAS OF WORK SHALL BE RELOCATED.

ROOM 107 NEW RAMP PLAN
SCALE: 1/4" = 1'-0"
0 2' 4' 6'

**BULIDING 4491 PROVIDE ADA ACCESSIBILITY NEW RAMP AT ROOM 106
ADDEMDUM 1**

1. THE CONCRETE REPAIR MATERIAL SHALL BE "FIVE STAR STRUCTURAL CONCRETE", AS MANUFACTURED BY FIVE STAR PRODUCTS, OF FAIRFIELD, CT. TEL#: 203-336-7900, OR APPROVED EQUAL.
2. COMPLETELY REMOVE ALL LOOSE, DELAMINATED AND WEAK CONCRETE, OIL, GREASE, LAITANCE, AND OTHER CONTAMINANTS. PREPARE CONCRETE USING ACCEPTABLE MECHANICAL MEANS AS NECESSARY TO OBTAIN CLEAN, SOUND, AND ROUGH SURFACES.
3. SOAK CONCRETE THOROUGHLY WITH POTABLE WATER PRIOR TO PLACEMENT. CONCRETE SHALL BE SATURATED AND FREE OF STANDING WATER AT TIME OF PLACEMENT. AN EPOXY BONDING AGENT MAY BE USED IN LIEU OF PRESOAKING. APPLY EPOXY BONDING AGENT UNIFORMLY IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
4. INCORPORATE INTO REDLINE SUBMITTAL



 **BUILDING 4491**
NORTHEAST EXTERIOR DOOR PLAN
NOT TO SCALE

RESPONSE TO INQUIRY REGARDING FLOOR ELEVATION ADA COMPLIANCY

SECTION 23 21 23.16

BASE-MOUNTED CENTRIFUGAL HYDRONIC PUMPS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Pumps for Heating, Ventilating and Air Conditioning (Chilled Water, Hot Water)
- B. Definitions:
 - 1. Capacity: Gallons per minute (GPM) of the fluid pumped.
 - 2. Head: Total dynamic head in feet of the fluid pumped.
 - 3. Flat head-capacity curve: Where the shutoff head is less than 1.16 times the head at the best efficiency point.

1.02 RELATED WORK

- A. Section 23 05 00, Common Work Results for HVAC
- B. Section 23 05 00.01, Laser Alignment For HVAC Pumps & Rotating Equipment
- C. Section 23 05 48, Vibration Controls for HVAC Pumps & Rotating Equipment
- D. Section 23 21 13, Above-Ground Hydronic Piping

1.03 SUBMITTALS

- A. Submit for approval: Items listed on the Schedule of Submittals in accordance with Section 01 33 00.
- B. Manufacturer's Literature and Data:
 - 1. Pumps and accessories.
 - 2. Motors and drives.
 - 3. Variable speed motor controllers.
- C. Manufacturer's installation, maintenance and operating instructions shall include MOD #, Ser. #, & Date Installed.
- D. Characteristic Curves: Head-capacity, efficiency-capacity, brake horsepower-capacity, and NPSHR-capacity for each pump and for combined pumps in parallel or series service. Identify pump and show fluid pumped, specific gravity, pump speed and curves plotted from zero flow to maximum for the impeller being furnished and at least the maximum diameter impeller that can be used with the casing.

PART 2 PRODUCTS

2.01 CENTRIFUGAL PUMPS, BRONZE FITTED (CHILLED WATER, INDUSTRIAL WATER)—NORMAL DUTY

- A. In-Line Type, Base Mounted End Suction or Double Suction Type:
 - A. Casing and Bearing Housing: Close-grained cast iron, ASTM A48.
- B. Casing Wear Rings: Bronze.
- C. Suction or Discharge 2-1/2 inches and Larger: Plain face flange, 125 psig, ANSI B16.1.
- D. Casing Vent: Manual brass cock at high point.
- E. Casing Drain and Gage Taps: 1/2-inch plugged connections minimum size.
- F. Bearings: Oil lubricated ball or roller type. Provide lip seal and slinger outboard of each bearing. Bearings are to have a B-10 rated life of 250,000hr. Shop drawings/submittal shall bear manufacturer's certification of bearing life.
- G. Impeller: Bronze, ASTM B62, enclosed type, keyed to shaft.
- H. Shaft: Steel, AISI Type 1045 or stainless steel.
- I. Shaft Seal: Manufacturer's standard mechanical type to suit pressure and temperature and fluid pumped.
- J. Shaft Sleeve: Bronze or stainless steel.
- K. Motor: Furnish with pump. To be rated NEMA Premium Efficiency.
- L. Base Mounted Pumps:
 - 1. Designed for disassembling for service or repair without disturbing the piping or removing the motor.
 - 2. Impeller Wear Rings: Bronze.
 - 3. Shaft Coupling: Non-lubricated steel flexible type or spacer type with coupling guard, ANSI B15.1, bolted to the baseplate. (Woods or Lovejoy couplings are acceptable)
 - 4. Base: Cast iron or fabricated steel for common mounting to a concrete base.
 - 5. Suction Diffuser:
 - a. Body: Cast iron with steel inlet vanes and combination diffuser-strainer-orifice cylinder with 3/16-inch diameter openings for pump protection. Provide taps for strainer blown down and gage connections.
 - b. Provide adjustable foot support for suction piping.

- c. Strainer free area: Not less than five times the suction piping.
 - d. Provide disposable start-up strainer.
6. Suction Strainer, "Y" Type: Section 23 21 13, "ABOVE-GROUND HYDRONIC PIPING." May be furnished in lieu of a suction diffuser at the Contractor's option. Provide equivalent support of pump suction piping.

M. Variable Speed Pumps:

- 1. The pumps shall be the type shown on the drawings and specified herein flex coupled to an open drip-proof motor. Provide motors 40 horsepower and larger with thermal overload switches.
- 2. Variable Speed Motor Controllers: Refer to Section 26 29 23, "VARIABLE FREQUENCY MOTOR CONTROLLERS." Furnish controllers with pumps and motors.
- 3. Pump operation and speed control shall be as shown on the drawings.

2.02 CENTRIFUGAL PUMPS (ie: MSFC CHILLED WATER SYSTEM PRIMARY AND SECONDARY PUMPS AT BUILDING 4473)

A. GENERAL

1. REFERENCES

The publications listed below form a part of this section to the extent referenced:

ANTI-FRICTION BEARING MANUFACTURERS ASSOCIATION (AFBMA)

AFBMA 11n –

Load Ratings and Fatigue Life for Roller Bearings

AFBMA 9 –

Load Ratings and Fatigue Life for Ball Bearings

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B16.1 (2010) –

Cast Iron Pipe Flanges and Flanged Fittings

HYDRAULIC INSTITUTE (HI) –

Standards for Centrifugal HI 1.1-1.4 Pumps

2. GENERAL REQUIREMENTS

Pumps shall be used for chilled water service (39-55 degrees F water temperature). Pumps shall be bronze fitted Aurora or equal.

B. PUMP CONSTRUCTION**1. General Pump Requirements**

This specification includes design, construction, installation, and performance features of centrifugal water pumps. Pumps provided shall conform to HI 1.1-1.4, and to requirements specified herein.

Pump, frame, motor, and coupling shall be provided as a complete factory assembled unit.

2. Pump Capacity

Pump capacity shall be as indicated in the schedules.

3. Classification

Class ADS: Axially (horizontally) split-case, single-stage, double-suction, single- or double-volute centrifugal type.

4. Casting

Pump castings shall be bronze-fitted seasoned, cast iron with a design working pressure of not less than 185 pounds per square inch gage (psig) at 100 degrees F. Castings shall be single or double volute with flanged piping connections conforming to ASME B16.1, Class 125. The direction of shaft rotation shall be conspicuously indicated. The casting shall have tapped openings for air venting, priming, draining, and suction and discharge gages. A brass or bronze umbrella or vent cock shall be furnished for venting. Drain openings in the volute, intake, or other passages capable of retaining trapped water shall be located in the low point of such passages.

5. Impellers

Impellers shall be enclosed cast bronze or stainless steel machined and polished. Waterways shall be machine- or hand-finished. Impellers shall meet maximum and minimum diameters requirements.

6. Balancing

Pump Impeller assemblies shall be statically and dynamically balanced to within ½ percent of W times R squared, where W equals weight and R equals impeller radius.

Rotating elements shall be dynamically balanced.

7. Wearing Rings

Wearing rings shall be dissimilar bronze composition for non-galling service. Wearing rings shall be provided in every

pump case and on all impellers larger than 7 inches in diameter.

8. Shaft

Shafts for mechanical seal service shall be solid sleeveless AISI 400 series stainless steel hardened to 425 Brinell in packing area, or sleeved type with AISI 304 and AISI 316 series stainless-steel sleeves hardened to 425 Brinell.

Shaft construction shall be substantial to prevent seal or bearing failure due to vibration. Total shaft peak-to-peak dynamic deflection measured by vibrometer at pump-seal face shall not exceed 2.0 mils under shutoff-head operating conditions. Flow from ¼ inch iron pipe size (ips) pipe shall be provided during testing.

Shaft shall be equipped with bronze or nylon water slingers at each bearing and shall be sealed at the casting interface with a bronze throttling bushing.

9. Mechanical Seals

Mechanical seals shall be balanced or unbalanced, as necessary to conform to specified service requirements. Mechanical seals shall be constructed in a manner and of materials particularly suitable for the temperature service range and chemical analysis of water being pumped.

Cooling-water characteristics for seal construction purposes are as follows: makeup total dissolved solids of 200 parts per million (PPM) cycled up to five times, containing not more than 600 PPM of hexavalent chromate, and Ph not less than 6.0.

Seal construction shall not require external source cooling for pumped-fluid service temperatures up to 250 degrees F.

Seal pressure rating shall be suitable for maximum system hydraulic conditions. (Maximum system pressure – 125 psig).

Materials of construction shall include AISI 300 series stainless steel, solid tungsten-carbide rotating-seal face, and Buna-N vinylidene-fluoride-hexafluoropropylene, EPT, or tetrafluoroethylene seals.

Mechanical seals shall not be subjected to hydrostatic test pressures in excess of the manufacturer's recommendations.

Mechanical seals shall be manufacturer's standard for the specified and indicated service. Bypass flushing water supply shall be free of iron rust products and other abrasive materials and shall be directed onto face of seal without

dead ending. All piping and accessories necessary to the function shall be provided.

10. Bearings and Lubrication

Bearings shall be heavy-duty ball or roller type with full provisions for the mechanical and hydraulic radial and thrust loads imposed by any normal service condition. Bearings shall be manufactured from vacuum-degassed or processed-alloy steel. Thrust-bearing endplay shall not exceed 0.005 inch. Thrust bearings shall be secured to the shaft by threaded collar and locknut. Double-row ball or roller bearings shall be self-aligning. Bearings shall have a B-10 rated life of not less than 250,000 hours. Shop drawings shall bear manufacturer's certification of bearing life.

Bearings shall be oil lubricated and shall be provided with oil supply reservoirs located at top of bearings.

Bearing housings shall be cast iron, self-aligning on metal-to-metal surfaces and shall totally enclose bearings.

11. Flexible Coupling

Pump shaft shall be connected to the motor shaft through a flexible coupling. The flexible member shall be a tire shape in shear, or a solid-mass serrated-edge disc shape made of chloroprene materials and retained by fixed flanges. Flexible coupling shall act as a dielectric connector and shall not transmit sound, vibration, or end thrust. Woods or Lovejoy Couplings are acceptable.

12. Bedplate

Pump and driver shall be mounted on a common bedplate, hollow cast iron, multi-ribbed for maximum rigidity, with adequate number of grout holes and grout air vents, and with drip rim and drain tapping.

The Contractor shall submit for approval, when specified, a fabricated steel base constructed of a rolled structural-steel perimeter frame, reinforced and cross-braced internally with pipe or rolled structural members, capped with ¼ inch steel plate, and provided with adequate grout holes, grout air vents, drip rim, and drain tapping. Formed or bent steel bedplates are not acceptable.

13. Motors

Pump motors shall be checked for current direction of rotation only after pumps have been primed and approved by the manufacturer's representative and the Contracting Officer.

Motors shall be permanently tagged as quiet, when so specified. Motors shall be TEFC construction, suitable for variable speed frequency inverter service, dynamically and statically balanced.

Motors shall be rated NEMA Premium Efficiency.

14. Special Requirements

Plugged or valved casing drains which may require ipss red-brass pipe shall be brought out beyond periphery of casing to facilitate drainage. Volute plugs at flanges shall be assembled with tetrafluoroethylene tape.

Provide six machines screw taps of a diameter not to exceed $\frac{1}{2}$ inch and a depth not to exceed $\frac{3}{4}$ inch shall be provided for each pump/motor assembly. To be performed in the field at locations as directed by the Contracting Officer. Taps will be used for predictive maintenance vibration monitoring.

Installed vibration levels shall not exceed those specified in Section 23 05 48.

2.03 HOT WATER PUMP

- A. Centrifugal, single stage, constructed to prevent contact of water with metal other than non-ferrous, except casing.
- B. Driver shall be electric motor, close coupled or connected by flexible coupling.
- C. Shall be designed for 180 deg.F water service.
- D. Mounting shall be either of the following:
 - In-line mounted
 - Floor mounted set on common bed plate with drip lip
- E. Casing: Cast iron, vertically or horizontally split
- F. Impeller: High grade, cast brass or bronze, accurately machined and properly balanced
- G. Motor: Motor to be rated NEMA Premium Efficiency. Capacity to be such as to operate pump without overloading. In-line pump motors shall not exceed 1800 rpm and shall be provided with spring mountings or other devices to assure quiet operation.
- H. Pump and motor bearings shall be B-10 rated with a minimum life of 250,000 hours. Shop drawings/submittals shall bear manufacturer's certification of bearing life.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Pumps shall be stored indoors and protected against dust and moisture. Provide expanded foam on the air inlet and outlet parts of the motor and cover pump suction and discharge flanges to prevent entry of foreign matter.
- B. Follow manufacturer's written instructions for pump mounting and start-up. Access/ Service space around pumps shall not be less than minimum space recommended by pumps manufacturer.
- C. Independently support pumps and piping so that the weight of the piping is not supported by the pumps and the weight of the pumps is not supported by the piping. The first 3 hangers for each pipe shall be spring and neoprene type.
- D. Sequence of installation for base-mounted pumps:
 - 1. Level and shim the unit base and grout to the concrete pad.
 - 2. Shim the driver and realign the pump and driver. Correct axial, angular or parallel misalignment of the shafts per Section 23 05 00.01, "LASER ALIGNMENT FOR HVAC PUMPS & ROTATING EQUIPMENT."
 - 3. Connect properly aligned and independently supported piping.
 - 4. Recheck alignment.
- E. Pad-mounted Condensate Pump: Level, shim, bolt, and grout the Unit base onto the concrete pad.
- F. Provide drains for bases and seals for base mounted pumps, piped to and discharging into floor drains.

3.02 START-UP

- A. Verify that the piping system has been flushed, cleaned and filled.
- B. Lubricate pumps before start-up.
- C. Prime the pump, vent all air from the casing and verify that the rotation is correct. To avoid damage to mechanical seals, never start or run the pump in dry condition. Mechanical Seal or Packing Flush Water Lines must be cleaned before pump start-up.
- D. Verify that correct size heaters-motor over-load devices are installed for each pump controller unit.
- E. Perform field mechanical balancing if necessary to meet specified vibration tolerance.
- F. Ensure the disposable strainer is free of debris prior to testing and balancing of the hydronic system, if applicable.

- G. After several days of operation, replace the disposable start-up strainer with a regular strainer in the suction diffuser, if applicable.
- H. Pump and piping flanges shall be aligned so that the connecting bolts will fit freely with no external forces applied to pump or piping.
- I. The contractor shall provide laser alignment of the pump and pump motor shafts after setting pump on foundation, grout has been set, foundation bolts have been tightened, and piping connections have been completed. Other methods of pump alignment will not be accepted. The Government reserves the right to verify pump alignment and to require re-alignment where necessary. Laser alignment shall be per Section 23 05 00.01.

END OF SECTION

Functional Performance Verification

Process Water Cooling System

Marshall Space Flight Center
Building 4605, FWR 2117333.B

1. Participants

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ TAB Contractor	_____ Date
_____ NASA Facilities Engineering Mechanical Engineer	_____ Date	_____ Government UCS Representative	_____ Date
_____ NASA Facilities Operation and Maintenance Representative	_____ Date	_____ Government CMI	_____ Date

Approvals. This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted below.

_____ Commissioning Agent	_____ Date	_____ Owner's Representative	_____ Date
------------------------------	---------------	---------------------------------	---------------

Functional Performance Verification

Process Water Cooling System

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2. Requested documentation submitted

- ___ Attach equipment schedule to this checklist
- ___ Attach design criteria to this checklist
- ___ Attach sequence of operation to this checklist
- ___ Attach detail drawing to this checklist

3. Pre-functional Checklists

- a. ___ The following have been started up and startup reports and prefunctional checklists submitted and approved ready for functional testing:
- ___ Chiller
 - ___ Process Cooling Water Piping and Valves
 - ___ Process Water Cooling Pumps
 - ___ Variable Speed Drives
- b. ___ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules and with debugging, loop tuning and sensor and device calibrations completed.
- _____
- Controls Contractor Signature or Verbal
- _____
- Date
- c. ___ Piping system flushing complete and required report approved.
- d. ___ Water treatment system complete and operational.
- e. ___ Test and balance (TAB) complete and approved for the hydronic system.
- f. ___ All A/E punchlist items for this equipment corrected.
- g. ___ These functional test procedures reviewed and approved by installing contractor.
- h. ___ Safeties and operating ranges reviewed.
- i. ___ Test requirements and sequences of operation attached.
- j. ___ Schedules and setpoints attached.
- k. ___ Sufficient clearance around equipment for servicing.
- l. ___ Have all energy savings control strategies, setpoints and schedules been incorporated that this chiller and control system are capable of? If not, list recommendations below.
- m. ___ **Building Automation System (BAS) Program Review.** Review the BAS software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.
- n. ___ **Packaged Control Program Review.** Review the packaged control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.
- o. ___ Record made of all values for current set points, control parameters, limits, delays, lockouts, schedules, etc. changed to accommodate testing:

Parameter	Pre-Test Values	Returned to Pre-Test Values <input checked="" type="checkbox"/>
Chiller set point		
DPS set point		
Maximum Pump Speed with chiller on		
Minimum Pump Speed with chiller on		
Minimum Pump Speed with chiller off		

Functional Performance Verification

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4. Sensor Calibration Checks

Check the sensors listed below for calibration and adequate location. This is a sampling check of calibrations done during the prefunctional check.

“In calibration” means making a reading with a calibrated test instrument within 6 inches of the site sensor. Verify that the sensor reading (via the permanent thermostat, gage or building automation system (BAS)) compared to the test instrument-measured value is within the tolerances specified in the pre-functional checklist requirements. If not, install offset in BAS, calibrate or replace sensor. Use the same test instruments as used for the original calibration, if possible.

Sensor & Location	Location OK ¹	1st Gage or BAS Value	Instrument Measured Value	Final Gage or BAS Value	Pass Y/N?
PWS Temperature					
PWR Temperature					
DPS actual ^{1,2}					

¹At any speed.

²During TAB, the TAB contractor shall compare their instrument readings with BAS readings.

5. Device Calibration Checks

The actuators or devices listed below checked for calibration. This is a spot check on a sample of the calibrations done during prefunctional checklisting and startup.

“In calibration” means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	Expected Value	Site Observation	Final Values	Pass Y/N
CHWP-0003 speed	5% Open				
CHWP-0003 speed	95% Open				
CHWP-0004 speed	5% Open				
CHWP-0004 speed	95% Open				
Bypass Control Valve	5% Open				
Bypass Control Valve	95% Open				

6. Verification of Misc. Prefunctional Checks.

Misc. site checks of the prefunctional checklist and startup reports completed successfully. Pass? Y / N _____

Functional Performance Verification

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7. Testing Procedures and Record

Proced. No. & Spec. Seq. ID ¹	Req ID No. ²	Test Procedure ³ (including special conditions)	Expected and Actual Response ⁴ [Write ACTUAL response in brackets or circle]	Pass Y/N	Note #
1		Raise PWS temperature set point to ensure chiller is de-energized and close all isolation valves in run out piping to lab equipment.	PWS temperature set point [_____]°F PWS temperature actual [_____]°F PWR temperature actual [_____]°F CHLR-0002 status [_____] CHWP-0003 command [_____] CHWP-0004 command [_____] CHWP-0003 status [_____] CHWP-0004 status [_____] DPS set point [_____]psig DPS actual [_____]psig Bypass control valve position [_____] % Flow switch status [_____]		
2		Enable process cooling water pumps and allow system to stabilize.	CHWP-0003 command [_____] CHWP-0004 command [_____] CHWP-0003 status [_____] CHWP-0004 status [_____] CHWP-0003 speed [_____]Hz CHWP-0004 speed [_____]Hz DPS actual [_____]psig Bypass control valve position [_____] % Flow switch status [_____]		
3		Raise DPS set point 10 psig and allow system to stabilize.	CHWP-0003 command [_____] CHWP-0004 command [_____] CHWP-0003 status [_____] CHWP-0004 status [_____] CHWP-0003 speed [_____]Hz CHWP-0004 speed [_____]Hz DPS set point [_____]psig DPS actual [_____]psig Bypass control valve position [_____] %		
4		Toggle Lead pump and allow system to stabilize.	CHWP-0003 command [_____] CHWP-0004 command [_____] CHWP-0003 status [_____] CHWP-0004 status [_____] CHWP-0003 speed [_____]Hz CHWP-0004 speed [_____]Hz		
5		Reset DPS set point to recorded value in step 1.	CHWP-0003 command [_____] CHWP-0004 command [_____] CHWP-0003 status [_____] CHWP-0004 status [_____] CHWP-0003 speed [_____]Hz CHWP-0004 speed [_____]Hz DPS set point [_____]psig DPS actual [_____]psig Bypass control valve position [_____] %		
6		Lower PWS temperature set point to the value recorded in step 1 (or lower if required) to ensure chiller energizes.	PWS temperature set point [_____]°F CHLR-0002 status [_____] CHLR-0002 capacity [_____] %		
7		Allow system to stabilize at PWS set point.	PWS temperature actual [_____]°F PWR temperature actual [_____]°F		

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Proced. No. & Spec. Seq. ID ¹	Req ID No. ²	Test Procedure ³ (including special conditions)	Expected and Actual Response ⁴ [Write ACTUAL response in brackets or circle]	Pass Y/N	Note #
8		Lower PWS temperature set point to ensure chiller operates on all stages.	PWS temperature set point [_____]°F CHLR-0002 capacity [_____]%		
9		Reset PWS temperature set point to the value recorded in step 1.	PWS temperature set point [_____]°F		
10		Slowly open isolation valves in run out piping to lab equipment and energize lab equipment to create a load on the process cooling water system until the bypass control valve is in the fully closed position.	Bypass control valve position [_____]%		
11		Allow system to stabilize at PWS set point.	PWS temperature set point [_____]°F PWS temperature actual [_____]°F PWR temperature actual [_____]°F CHLR-0002 status [_____]_____ CHLR-0002 capacity [_____]_____ CHWP-0003 command [_____]_____ CHWP-0004 command [_____]_____ CHWP-0003 status [_____]_____ CHWP-0004 status [_____]_____ CHWP-0003 speed [_____]Hz CHWP-0004 speed [_____]Hz DPS actual [_____]psig		
Alarms and Safeties					
12		Alarm condition: PWS temperature is greater than PWS set point by 8°F for more than 30 minutes. Lower PWS set point by 10°F and lower alarm time duration to 1 minute. Wait for 1 minute to elapse.	PWS temperature set point [_____]°F PWS temperature actual [_____]°F Alarm time duration [_____]m Alarm message displayed [_____]_____		
13		Reset values to prior set points and allow system to stabilize.			
14		Alarm condition: PWS or PWR temperature falls below 36°F. Raise freeze watch set point to a temperature greater than the current PWS or PWR set point.	PWS temperature set point [_____]°F PWS temperature actual [_____]°F PWR temperature actual [_____]°F Alarm message displayed [_____]_____		
15		Reset values to prior set points and allow system to stabilize.			
16		Alarm condition: PWS or PWR temperature falls below 32°F. Raise hard freeze warning set point to a temperature greater than the current PWS or PWR set point.	PWS temperature set point [_____]°F PWS temperature actual [_____]°F PWR temperature actual [_____]°F Alarm message displayed [_____]_____		
17		Reset values to prior set points and allow system to stabilize.			
18		Alarm condition: Process cooling water flow rate exceeds chiller maximum flow rate of 85 gpm. Coordinate and verify with TAB and controls contractor. Lower maximum flow rate alarm set point to 20 gpm.	Alarm message displayed [_____]_____		

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Proced. No. & Spec. Seq. ID ¹	Req ID No. ²	Test Procedure ³ (including special conditions)	Expected and Actual Response ⁴ [Write ACTUAL response in brackets or circle]	Pass Y/N	Note #
19		Reset values to prior set points and allow system to stabilize.			
20		Alarm condition: Process cooling water flow rate falls below chiller minimum flow rate of 40 gpm. Coordinate and verify with TAB and controls contractor. Raise minimum flow rate alarm set point to 100 gpm.	Alarm message displayed [_____]		
21		Reset values to prior set points and allow system to stabilize.			
22		Close all isolation valves in run out piping to lab equipment, de-energize chiller and de-energize lab equipment. Allow system to stabilize.	CHWP-0003 command [_____] CHWP-0004 command [_____] CHWP-0003 status [_____] CHWP-0004 status [_____] CHWP-0003 speed [_____]Hz CHWP-0004 speed [_____]Hz DPS actual [_____]psig Bypass control valve position [_____]%		
23		Observe.	CHWP-0003 command [_____] CHWP-0004 command [_____] CHWP-0003 status [_____] CHWP-0004 status [_____] CHWP-0003 speed [_____]Hz CHWP-0004 speed [_____]Hz		
24		Alarm condition: Pump failure. Turn off electrical disconnect to lead pump.	CHWP-0003 command [_____] CHWP-0004 command [_____] CHWP-0003 status [_____] CHWP-0004 status [_____] CHWP-0003 speed [_____]Hz CHWP-0004 speed [_____]Hz Alarm message displayed [_____]		
25		Alarm condition: Pumps fail to develop pressure through variable frequency drive. Turn off electrical disconnect to lag pumps.	CHWP-0003 command [_____] CHWP-0004 command [_____] CHWP-0003 status [_____] CHWP-0004 status [_____] CHWP-0003 speed [_____]Hz CHWP-0004 speed [_____]Hz DPS actual [_____]psig Bypass control valve position [_____]% Alarm message displayed [_____]		
26		Alarm condition: A pump is requested to start and there is no indication of flow.	CHWP-0003 command [_____] CHWP-0004 command [_____] Flow switch status [_____] Alarm message displayed [_____]		
27		Turn on electrical disconnects to pumps and allow system to stabilize.			

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Proced. No. & Spec. Seq. ID ¹	Req ID No. ²	Test Procedure ³ (including special conditions)	Expected and Actual Response ⁴ [Write ACTUAL response in brackets or circle]	Pass Y/N	Note #
28		Alarm condition: Process cooling water bypass control valve fails to relieve pressure at minimum flow set point. Lower DPS set point to 1 psi and Raise lead pump speed to 60Hz.	CHWP-0003 status [_____] CHWP-0004 status [_____] CHWP-0003 speed [_____]Hz CHWP-0004 speed [_____]Hz DPS set point [_____]psig DPS actual [_____]psig Bypass control valve position [_____]% Alarm message displayed [_____]		
29		Reset values to prior set points and allow system to stabilize.			
30	--	Return all changed control parameters and conditions to their pre-test values⁵	Check off in table of Section 2 above when completed		

**Abbreviations: PWS = process water supply, PWR = process water return, DPS = differential pressure sensor

¹Sequences of operation attached to this test.

²Mode or function ID being tested from testing requirements section of the project Specifications.

³Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

⁴Include tolerances for a passing condition. Fill-in spaces or lines not in brackets denote sequence parameters still to be specified by the A/E, controls contractor or vendor. Write "Via BAS" for verifications of device position from BAS readout or "Via obs" for actual observation or from test instrument reading.

⁵Record any permanently changed parameter values and submit changes to Owner.

A summary of deficiencies identified during testing is attached _____ yes _____no

-- END OF TEST --

**MPR 8715.1
REVISION I**

**EFFECTIVE DATE: June 8, 2011
EXPIRATION DATE: June 8, 2016**

MARSHALL PROCEDURAL REQUIREMENTS

QD01

MARSHALL SAFETY, HEALTH, AND ENVIRONMENTAL (SHE) PROGRAM

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Marshall Procedural Requirements QD01		
Marshall Safety, Health, and Environmental (SHE) Program	MPR 8715.1	Revision: I
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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline		7/10/00	The MSFC SHE Program describes the MSFC occupational safety, health, and environmental (SHE) program. Emphasis is placed on the industrial safety portion of the SHE Program, but pointers are provided to the health and environmental program documents.
Revision	A	8/23/01	This document has been rewritten in its entirety.
Revision	B	2/20/2004	Improve wording, general update, incorporate new SHE Committee arrangement, align format with OSHA's VPP elements, revise and expand goals and objectives, document requirement for including safety in personnel performance evaluations, clarify how employees are involved in SHE Program, clarify contractor SHE requirements, incorporate new SHetrak and SSWP processes, add organization SHE award program, add organization level self-assessment and SHE employee SHE survey requirements, add annual SHE Program assessment and planning process, add baseline assessment requirements, document mishap awareness process, add work hour limitation guidelines, add disciplinary system, , update building manager rules, and add revised guideline for storage on top of furniture.
Revision	C	10/29/2004	Revised to bring document in compliance with the HQ Rules Review Action (CAITS: 04-DA01-0387). Changes were also made to reflect S&MA organizational name changes (i.e., QS to QD). Revised safety and health goals and objectives.
Revision	D	1/17/2006	Clarify safety training requirements for non-contractor (grants, etc.) type employees. Clarify inspection requirements for offsite facilities. Incorporate changes to the SHE Committee program. Revised policy and objective to match metrics. Relocate Building Manager Program to another document. Revised policy to include support of mission. Added Vision and moved goals to the annual plan. Added requirement for S&MA audits of organizations and SHE programs. Added references and relationships to the new IMSB. Added reference to the new SHE Training Assessment process. Added a commitment statement to the four major elements of the NASA Safety Program. Added requirement for use of cargo containers. Updated numerous references and organizational names. Various clarifications.
Revision	E	10/10/2007	Revised numerous references and organization names. Revised reference to MESA agreement. Revised principles to the MSFC safety program. Revised environmental policy. Deleted requirements now in MWI 8715.12. Revised annual evaluation and annual plan into one document. Revised manual lifting rule. Revised variance process. Revised definitions.
Revision	F	4/16/2008	Revised 2. Applicability statement to address the applicability of this directive to the Michoud Assembly Facility (MAF). Added responsibilities for MAF in various sections. Changed safety department to safety branch. Changed appendices that contained requirements to chapters. Reflects minor editorial changes. [On 5/23/08, an administrative correction updated name change for MWI 8715.15.]

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Revision	G	12/01/2008	Expanded Table of Contents. Changed NASA MAF Safety Office to MSFC S&MA representative located at MSFC's MAF. Changed MAF Environmental Office to Center Operations representative located at MAF. Minor grammar changes to allow for a Table of Contents. Minor change to wording in Chapter 5 for variances. Added records for any required safety training. Added requirement for identifying controlled areas in Chapter 1 and Chapter 2.
Revision	H	12/03/2009	Deleted form letter 133. Provided more definition for comparison between MSFC SHE program and VPP elements in section 3. Made minor grammatical changes throughout. Added MWIs to applicability listing. Deleted Chapter 5 and rearranged order of section 2. Responsibilities. Added more details for work conducted at MAF. Added matrix for SHE to VPP requirements. Added acronyms
Revision	I	6/8/2011	Deleted MPD/MPR/MWI titles in body of document. Addressed NCRs 1264, 1265, 1266, 1269, 1280, and 1292. Updated 2.11 SHE Committee, 3.1.13 SHE Program evaluation, and 3.1.14 SHE Program Plan. Minor updates throughout MPR. Added several definitions and updated others to match other MWIs. Changed 3.1.15 variance to request for relief per NPR 8715.3 update. Defined process for contractor to receive MSFC safety performance awards. Updated Appendix B. Added reference for contractors to be compliant with the MSFC Quality Management System when performing safety related operations and processes.

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PREFACE

P.1 PURPOSE

a. To implement an aggressive Center-level Safety, Health, and Environmental (SHE) Program that complies with established policies in NPD 1800.2, NPD 8500.1, and NPD 8700.1, established requirements in NPR 1800.1, NPR 8621.1, NPR 8715.1, NPR 8715.2, and NPR 8715.3, and current applicable Federal, and State regulations, requirements, and standards as identified in P.3 Authority.

P.2 APPLICABILITY

a. This Marshall Procedural Requirements (MPR) applies to Center personnel, programs, projects, including contractors and resident agencies to the extent specified in their respective contracts or agreements. (“Contractors,” for purposes of this paragraph, include contractors, grantees, Cooperative Agreement recipients, Space Act Agreement partners, or other agreement parties.)

b. This MPR applies to the Michoud Assembly Facility (MAF).

c. This MPR does not apply to MSFC’s Flight Safety Program. For information concerning that program, refer to the program-level documents (e.g., Space Shuttle Program (SSP) – 50021 and NASA Safety Technical Standard (NSTS) 5300.4), or contact the MSFC Safety and Mission Assurance (S&MA) Directorate.

P.3 AUTHORITY

- a. Public Law 29 U.S.C. § 651 et seq., “Occupational Safety and Health Act of 1970”
- b. 29 CFR Part 1903, “Inspections, Citations, Proposed Penalties”
- c. 29 CFR Part 1910, “Occupational Safety and Health Standards”
- d. 29 CFR Part 1960, “Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters”
- e. 40 CFR Parts 1-1068, “Protection of the Environment”
- f. Louisiana Administrative Code, Title 33, Environmental Regulations (applicable only to MAF)
- g. Louisiana Administrative Code, Title 7, Part XXIII, Pesticide Program (applicable only to MAF)
- h. Louisiana Sanitary Code 48:5, Chapter 73 (applicable only to MAF)

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- i. EO 12196, dated February 26, 1980, “Occupational Safety and Health Programs for Federal Employees”
- j. NPD 1800.2, “NASA Occupational Health Program”
- k. NPD 8500.1, “NASA Environmental Management”
- l. NPD 8700.1, “NASA Policy for Safety and Mission Success”
- m. NPR 1800.1, “NASA Occupational Health Program Procedures”
- n. NPR 8621.1, “NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping”
- o. NPR 8715.1, “NASA Occupational Safety and Health Programs”
- p. NPR 8715.2, “NASA Emergency Preparedness Procedural Requirements”
- q. NPR 8715.3, “NASA General Safety Program Requirements”

P.4 APPLICABLE DOCUMENTS

MSFC complies with all applicable local, State, Federal, and consensus codes and standards.

- a. Public Law 7 U.S.C. § 135, Federal Insecticide, Fungicide, and Rodenticide Act (applicable only to MAF)
- b. Public Law 15 U.S.C. (C. 53) 2601-2692, Toxic Substance Control Act (applicable only to MAF)
- c. 29 CFR Part 1904, “Recording and Reporting Occupational Injuries and Illness”
- d. 29 CFR Part 1926, “Safety and Health Regulations for Construction”
- e. 48 CFR Part 1823, “Environment, Energy and Water Efficiency, Renewable Energy Technologies, Occupational Safety, and Drug Free Workplace”
- f. Alabama Department of Environmental Management (ADEM) Code R.335-6-7, “Qualified Credentialed Professional (QCP)”
- g. American National Standards Institute (ANSI) - All Standards as applicable

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- h. Louisiana Department of Environmental Quality (LDEQ), Title 33 Environmental Regulatory Code (applicable only to MAF)
- i. Louisiana Department of Health and Hospitals, Drinking Water Distribution Systems and Wastewater Collections Systems Operator Certification Program (applicable only to MAF)
- j. Louisiana Department of Agriculture and Forestry, Pesticide Laws and Regulations, as applicable (applicable only to MAF)
- k. National Fire Protection Association (NFPA) Codes
- l. NASA FAR Supplement (NFS) Part 1823.70, "Safety and Health"
- m. NPD 8820.2, "Design and Construction of Facilities"
- n. NPR 1441.1, "NASA Records Retention Schedules (NRRS)"
- o. NPR 7120.5, "NASA Space Flight Program and Project Management Processes and Requirements"
- p. NPR 8820.2, "Facility Project Requirements"
- q. NPR 8831.2, "Facilities Maintenance and Operations Management"
- r. NASA-STD-8719.7, "Facility System Safety Guidebook"
- s. NASA-STD-8719.9, "Standard for Lifting Devices and Equipment"
- t. NASA-STD-8719.11, "Safety Standard for Fire Protection"
- u. MPD 1040.3, "MSFC Emergency Program"
- v. MPD 1150.1, "Establishment of Councils, Boards, and Committees," MC-12
- w. MPD 1280.1, "Marshal Quality Management System Manual"
- x. MPD 1800.1, "MSFC Smoking Policy"
- y. MPD 1840.1, "MSFC Environmental Health Program"
- z. MPD 1840.2, "MSFC Hearing Conservation Program"
- aa. MPD 1840.3, "MSFC Respiratory Protection Program"

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- bb. MPD 1860.2, “Radiation Safety Program”
- cc. MPD 8500.1, “MSFC Environmental Management Policy”
- dd. MPD 8570.1, “MSFC Energy and Water Management Program”
- ee. MPR 1040.3, “MSFC Emergency Plan”
- ff. MPR 1280.6, “Management Systems Internal Audits”
- gg. MPR 1410.2, “Marshall Management Directives Systems”
- hh. MPR 1440.2, “MSFC Records Management Program”
- ii. MPR 1600.1, “MSFC Security Procedural Requirements”
- jj. MPR 1800.1, “Bloodborne Pathogens and Biohazardous Materials”
- kk. MPR 1800.2, “MSFC Ergonomics Program”
- ll. MPR 1800.3, “MSFC Sanitation Program”
- mm. MPR 1810.1, “MSFC Occupational Medicine”
- nn. MPR 1840.1, “MSFC Confined Space Entries”
- oo. MPR 1840.2, “MSFC Hazard Communication Program”
- pp. MPR 1840.3, “MSFC Hazardous Chemicals in Laboratories Protection Program”
- qq. MPR 1840.4, “MSFC Asbestos Program”
- rr. MPR 1860.1, “MSFC Radiation Safety Procedural Requirements”
- ss. MPR 1860.2, “Nonionizing Radiation Safety”
- tt. MPR 3410.1, “Training”
- uu. MPR 6410.1, “Handling, Storage, Packaging, Preservation, and Delivery (HSPPD)”
- vv. MPR 6700.1, “MSFC Vehicle and Motor Pool Operations”
- ww. MPR 8500.1, “MSFC Environmental Management Program”

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- xx. MPR 8500.2, “MSFC Environmental Management System (EMS) Manual”
- yy. MWI 1700.2, “System Safety Program”
- zz. MWI 1700.3, “NASA Safety Reporting System Corrective Action Process”
- aaa. MWI 1280.5, “MSFC Alert Processing”
- bbb. MWI 1810.1, “Automated External Defibrillator (AED) Program”
- ccc. MWI 3410.1, “Personnel Certification Program”
- ddd. MWI 5115.2, “Source Evaluation Board/Committee (SEB/C) Process”
- eee. MWI 6430.1, “Lifting Equipment and Operations”
- fff. MWI 8540.2, “Green Purchasing Program”
- ggg. MWI 8550.1, “Waste Management”
- hhh. MWI 8550.2, “Storm Water Management”
- iii. MWI 8550.3, “Wastewater Compliance”
- jjj. MWI 8550.4, “Air Emissions Compliance”
- kkk. MWI 8550.5, “Chemical Management”
- lll. MWI 8621.1, “Mishap and Close Call Reporting and Investigation Program”
- mmm. MWI 8710.1, “Inspection and Certification Process for Pressure Vessels and Systems (PVS)”
- nnn. MWI 8715.1, “Electrical Safety Program”
- ooo. MWI 8715.2, “Control of Hazardous Energy (Lockout/Tagout) Program”
- ppp. MWI 8715.3, “Hazard Identification and Warning System”
- qqq. MWI 8715.4, “Personal Protective Equipment (PPE) and Systems”
- rrr. MWI 8715.5, “Area/Building Manager Program”
- sss. MWI 8715.9, “Occupational Safety Requirements for MSFC Contractors”

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- t. MWI 8715.10, “Explosives, Propellants, and Pyrotechnics Program”
- uuu. MWI 8715.11, “Fire Safety Program”
- vvv. MWI 8715.12, “Safety, Health and Environmental-Finding Tracking System (SHEtrak)”
- www. MWI 8715.13, “Safety Concerns Reporting System (SCRS)”
- xxx. MWI 8715.15, “Ground Operations Safety Assessment Program”
- yyy. MWI 8715.16, “Supervisor Safety, Health and Environmental (SHE) Visits”
- zzz. MWI 8715.17, “Hazardous Operations Readiness Review Program”
- aaaa. MC-12, “MSFC Safety, Health and Environmental (SHE) Committee”
- bbbb. MC-21, “MSFC Integrated Management System Council (IMSC)”
- cccc. MCP 8715.1, “Annual SHE Program Plan”
- dddd. Data Requirement Document (DRD) STD/SA-SHP
- eeee. Data Requirement Document (DRD) STD/SA-ASHE
- ffff. Agreement between George C. Marshall Space Flight Center and Marshall Engineers and Scientists Association (MESA), Article 19, Safety and Health
- gggg. Agreement between George c. Marshall Space Flight Center and the American Federation of Government Employees (AFGE)

NOTE: The MPDs/MPRs/MWIs listed above are only applicable to MAF if stated as applicable in the MPD/MPR/MWI Applicability Statement.

P.5 REFERENCES

See Appendix E.

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P.6 CANCELLATION

MPR 8715.1H, dated December 3, 2009.

Original signed by

Robert M. Lightfoot
Director

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DOCUMENT CONTENT

1. DEFINITIONS

The terms defined below represent the most common safety terms used throughout the safety program. Additional definitions are provided in the applicable safety and health Center-wide instructions (e.g., Marshall Work Instructions (MWIs) and MPRs).

1.1 Area Manager (AM). Individual responsible for a given area of MSFC-controlled real property, who ensures a Building Manager (BM) is appointed for buildings in their area. See MWI 8715.5.

1.2 Assessment. Review or audit process, using predetermined methods, that evaluates hardware, software, procedures, technical and programmatic documents, and the adequacy of their implementation.

1.3 Assistant BM (ABM). Individual assigned responsibility to aid the BM in ensuring that their assigned buildings and surrounding areas are safe, healthful, and in compliance with environmental and housekeeping rules. See MWI 8715.5.

1.4 BM. Individual assigned by and responsible to the respective area manager to ensure that their assigned buildings and surrounding areas are safe, healthful, and in compliance with environmental and housekeeping rules. This is normally a collateral duty. If possible, the BM is selected from employees located in the assigned building. See MWI 8715.5.

1.5 Buddy System. An arrangement used when the level of risk for an injury is high, where personnel work in pairs, with one person in the pair is stationed nearby, not directly exposed to the hazard, to serve as an observer to render emergency assistance if needed.

1.6 Collateral Equipment. Encompasses building-type equipment, built-in equipment, and large, substantially-affixed equipment/property and is normally acquired and installed as part of a facility project. See NPR 8820.2.

1.7 Close Call. An occurrence in which there is no injury, no equipment/property damage equal to or greater than \$1,000, and no significant interruption of productive work, but which possesses a high-severity potential for any of the mishaps defined as Types A, B, or C Mishaps, Mission Failure, or Incident. See NPR 8621.1 and MWI 8621.1.

1.8 Deviation. A written authorization requested in advance during the formulation/planning/design stages of a program/project operation that grants temporarily relief from a specific requirement(s). See NPR 8715.3 and MPR 1410.2.

1.9 Employee. Any person (civil servant or contractor) that works on MSFC-controlled property or any civil servant that works for MSFC at any location.

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1.10 Facility. A term used to encompass land, buildings, structures, and other real property including utility systems and collateral equipment. This term does not include operating materials, supplies, special tooling, special test equipment, or non-capitalized equipment. The term facility is used in connection with land, buildings (facilities having the basic function to enclose usable space), structures (facilities having the basic function of a research or operational activity), and other real property improvement. A facility can involve a single operation or multiple operations being conducted within the same building or structure. See NPR 8820.2.

1.11 Green Products. Products that have a lesser or reduced effect on human health and the environment when compared with competing products that serve the same purpose. See MWI 8540.2.

1.12 Green Purchasing. The preferential procurement of green products. It is also known as Affirmative Procurement of Environmentally Friendly Products. See MWI 8540.2.

1.13 Hazard. A state or a set of conditions, internal or external to a facility or operation that has the potential to cause an undesired event.

1.14 Hazard Analysis. A term used to describe a method or technique used to identify hazards, the hazard cause, the hazard effect (undesired event), and their associated risks for a given facility or operation and for providing the corrective actions to mitigate these hazards and their risks. See MWI 8715.15.

1.15 Hazardous Facility/Operation. A facility or operation containing hazards of such a level that if not properly mitigated has the potential to cause an undesired event to occur. See MWI 8715.15.

1.16 Incident. An occurrence of a mishap or close call. See NPR 8621.1 and MWI 8621.1.

1.17 Incident Reporting Information System (IRIS). A NASA-wide database for recording and tracking mishap information. See NPR 8621.1 and MWI 8621.1.

1.18 Infrastructure. Systems, services, facilities and equipment necessary to sustain MSFC or MAF daily activities such as power, water, pressure, electrical, and other systems necessary to properly maintain a building's operation.

1.19 Integrated Management Systems Council (IMSC). A management-level board with membership consisting of the Center's Associate Director as chairperson and the Center Director's direct reports as members. It is responsible for the management of the Center's mission support. This includes ensuring the safety and health of the MSFC organization and its personnel. See MC-21.

1.20 Inventory of Hazardous Operations (IHOPS). An S&MA computer database listing

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facilities/operations identified to contain hazards that have the potential to cause an undesired event. See MWI 8715.15.

1.21 Job Hazard Analysis (JHA). An assessment that focuses on identifying hazards associated with jobs or tasks and taking the necessary actions to eliminate the hazards before they can occur. It focuses on the relationship between the worker, the job or task, the tools, and the work environment. This level safety assessment is normally conducted for facilities/operations identified to have an overall level of risk of low or minimal. A JHA is sometimes referred to as a Job Safety Analysis (JSA). A Safety Performance Assessment and Safe Plan of Action are equivalent forms of a JHA and serve the same purpose. See MWI 8715.15.

1.22 Marshall Team Meeting (MTM). A monthly meeting of top-level Center managers and support contractor managers where SHE metrics, issues, and initiatives and other Center-wide topics are discussed. The meeting is chaired by the Center Director.

1.23 Mishap. An unexpected occurrence, event, or sequence of events that results in injury or death to employees or visitors or damage to NASA equipment or property. See NPR 8621.1 and MWI 8621.1.

1.24 Non-collateral Equipment. All equipment other than collateral equipment. Such equipment, when acquired and used in a facility or a test apparatus, can be severed and removed after erection or installation without substantial loss of value or damage, thereto, or to the premises where installed. Non-collateral equipment imparts to the facility or test apparatus its particular character at the time (e.g., furniture in an office building, laboratory equipment in a laboratory, test equipment in a test stand, machine tools in a shop facility, and computers in a computer facility) and is not required to make the facility useful or operable as a structure or building. See NPR 8820.2.

1.25 Occupational Safety and Health Administration (OSHA). The organization established under the U.S. Department of Labor to administer the Occupational Safety and Health Act as documented in Part 29 of the Code of Federal Regulations (CFR).

1.26 Operation. A series of acts involved in a particular form of work, job, task, or process. It can involve personnel, equipment, the entire facility or only a section of a facility. See MWI 8715.15.

1.27 Overall Level of Risk. This term is assigned generally to a facility/operation that is intended to describe its potential level of risk that an undesired event can occur while operating the facility or performing the operation. The level of risk is normally selected based on (1) the complexity, structure, purpose and function of the facility/operation; (2) the visibility and/or value of the facility/operation; and (3) the potential for the facility/operation to cause an undesired event. The level of risk can also be selected by using the highest residual risk listed in a hazard analysis or a general consensus between the facility/operation owner and ISB of the appropriate level of risk for the facility/operation. It is the level of risk entered into IHOPS for a

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facility or operation or for a building into the ePORT database. See MWI 8715.15.

1.28 Real Property. Land and anything erected thereon or affixed or appurtenant thereto (e.g., buildings, structures, utility systems, and improvements). See NPR 8820.2.

1.29 Request for Relief. A written authorization for relief from a specific requirement(s) which can be a deviation or waiver. See NPR 8715.3.

1.30 Risk. The combination of (1) the probability (qualitative or quantitative) of experiencing the occurrence of an undesired event; (2) the consequences, impact, or severity that would occur if the undesired event were to occur; and (3) the uncertainties associated with the probability and consequences. See MWI 8715.15.

1.31 Safety Assessment. A disciplined, systematic approach to analyze and evaluate a facility/operation to determine its potential to effect the safety and health of personnel or its potential to cause damage to the environment, equipment or adjacent facilities/operations. A safety assessment is a general term that covers the total spectrum of methods used to identify hazards and the actions necessary to eliminate, reduce and control them. Safety assessments include all types of hazard analysis, JHAs, operating procedures, and readiness reviews. See MWI 8715.15.

1.32 Safety Critical. A term used to describe a condition, event, operation, process, equipment, or system that could cause or lead to severe injury, major damage, or mission failure if performed or built improperly, or allowed to remain uncorrected. See NPR 8715.3.

1.33 SHE Committee. A committee formed by employees and managers to help promote and improve the MSFC SHE programs. See MC-12.

1.34 Safety, Health and Environmental Finding Tracking System (SHEtrak). A Web-based electronic database maintained by S&MA for the purpose of documenting and tracking to closure hazards that are identified in the workplace. See MWI 8715.12.

1.35 Shall. The word “shall” indicates that the rule is mandatory. Noncompliance with a “shall” statement requires approval of a deviation or waiver.

1.36 Stop Work Authority. Authorization given to all employees located at MSFC and MAF to take the appropriate action necessary to stop or halt any operation/process/activity where they feel there is potential to result in loss of life, serious injury/illness to personnel or public, or damage to property or the environment.

1.37 Supervisor. The person assigned responsibility for the daily oversight functions of employees performing the job or task. This can include organizational first and second line manager, foreman, branch chief or team lead.

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1.38 System Safety. An engineering discipline that is applied during system development to study the entire system during its total life cycle or process in order to identify, mitigate, and document system hazards under all possible conditions, and in so doing eliminate or reduce the level of risk for a mishap and incident to occur. See NPR 8715.3, MWI 1700.2 and MWI 8715.15.

1.39 Undesired Event. An event or series of events which unleashes the potential inherent in a hazard and either directly or indirectly results in (1) injury, occupational-related illness, or death to personnel or the public; (2) damage to or loss of facilities/equipment; or (3) detrimental impact to the environment and the surrounding community. See MWI 8715.15.

1.40 Visitor. A person who has a temporary stay at MSFC and is not badged as a permanent employee.

1.41 Waiver. A written authorization requested after the fact that grants temporary relief from a specific requirement(s) and is requested during the implementation of a project or operation to address situations that were unforeseen during design or advance planning. See MPR 1410.2.

2. RESPONSIBILITIES

2.1 NASA Administrator

2.1.1 The NASA Administrator is the senior person responsible for Agency-wide safety and health. NPR 8715.1 establishes the NASA-Designated Safety and Health Official (DASHO) pursuant to EO 12196, "Occupational Safety and Health Programs for Federal Employees" section 1-102, to serve as the coordinator of the Occupational Safety and Health Programs.

2.1.2 The NASA-DASHO is the Chief Health and Medical Officer.

2.1.3 The NASA safety function is managed by the Office of Safety and Mission Assurance.

2.1.4 The NASA health function is managed by the Office of the Chief Health and Medical Officer.

2.1.5 The DASHO and the Chief Safety and Mission Assurance Officer, as members of the NASA Operations Management Council, provide for senior management involvement and oversight of NASA's Occupational Safety and Health Program.

2.2 The Center Director (CD) shall:

2.2.1 Have the final authority and responsibility for ensuring the NASA occupational safety and health programs are effectively implemented and operated at MSFC and MAF.

2.2.2 Promote safety by setting a positive example by following the rules, wearing any required

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personal protective equipment, reporting hazards, reporting injuries and illnesses, and basically doing anything that they expect employees to do.

2.2.3 Guide and direct the safety program for MSFC.

2.2.4 Establish, publicize, and monitor progress in achieving Center SHE goals and objectives. These goals are documented in the Annual SHE Program Plan.

2.2.5 Address SHE issues/concerns to MSFC and MAF employees as needed.

2.2.6 Conduct monthly SHE meetings with employees who report directly to them, and ensure supervisors at all levels conduct monthly SHE meetings with their employees.

2.2.7 Conduct walk-through SHE visits of activity areas and ensure supervisors at all levels conduct SHE visits of their respective areas in accordance with the requirements described in MWI 8715.16.

2.2.8 Ensure controls for SHE issues and concerns are integrated into the total MSFC management system.

2.2.9 Ensure all employees are provided with an equal and high-quality level of SHE protection.

2.2.10 Ensure employees and organizations responsible for implementing the SHE program elements and sub-elements have the authority and resources to carry out their responsibilities.

2.2.11 Evaluate the SHE performance of employees who report directly to them, using the performance appraisal process.

2.2.12 Approve and sign the Annual SHE Program Plan. See MCP 8715.1.

2.2.13 Ensure the operations and processes performed in the MSFC SHE Program are compliant with the requirements described in NPD 1800.2, NPD 8500.1, NPD 8700.1, NPR 1800.1, NPR 8715.1, and NPR 8715.3.

2.3 Directorate/Office Directors shall:

2.3.1 Promote safety by setting a positive example by following the rules, wearing any required personal protective equipment, reporting hazards, reporting injuries and illnesses, and basically doing anything that they expect employees to do.

2.3.2 Be responsible and accountable for the safety of personnel and property under their control, with timely monitoring, surveillance, and support provided by S&MA as necessary.

2.3.3 Apply the SHE Program to assigned areas of functional responsibility.

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2.3.4 Support achievement of the Center’s SHE goals and objectives.

2.3.5 Conduct monthly SHE meetings with employees (direct reports).

2.3.6 Conduct walk-through SHE visits of work areas within their area of responsibility in accordance with the requirements described in MWI 8715.16.

2.3.7 Support the SHE Committee, including providing a designated representative.

2.3.8 Evaluate SHE performance of employees (direct reports) using the performance appraisal system.

2.3.9 Ensure reporting and investigation of mishaps in accordance with the requirements described in NPR 8621.1 and MWI 8621.1.

2.3.10 Ensure all personnel, including visitors, contractors, and researchers working in their area of functional responsibility, comply with the requirements described in this MPR.

2.3.11 Ensure that facilities are operated in accordance with all applicable requirements, the intended design, and the requirements described in this MPR.

2.3.12 Ensure facilities/operations are assessed for hazardous conditions and that the facility’s/operation’s safety integrity is not compromised with non-approved facility/operation additions or modifications and receive the necessary level of readiness review prior to initial startup and restart in accordance with all applicable requirements and the requirements described in NASA-STD-8719.7, MWI 8715.15, and MWI 8715.17.

2.3.13 Ensure all lifting operations are conducted in accordance with the requirements described in NASA-STD-8719.9 and MWI 6430.1.

2.3.14 Ensure actions identified in Annual SHE Program Plan are appropriately implemented within their respective organization.

2.3.15 Ensure SHE issues and actions in responsible area are corrected.

2.3.16 Ensure a process is in place to assess jobs/tasks performed by employees to identify potential hazards prior to the job/task being performed by the employee. Any hazards that are identified are eliminated or actions (engineering or administrative) are taken to control the hazards and put in place prior to the job/task being performed.

2.3.17 Ensure a process is in place that establishes a line of communication with employees for them to have reasonable access to management in order to identify safety, health and environmental concerns within the organization.

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2.3.18 Ensure all employees within their respective organization are provided with an equal and high-quality level of SHE protection.

2.4 Managers of Program/Project Offices shall:

2.4.1 Promote safety by setting a positive example by following the rules, wearing any required personal protective equipment, reporting hazards, reporting injuries and illnesses, and basically doing anything that they expect employees to do.

2.4.2 Be responsible and accountable for the safety of personnel and property under their control, with timely monitoring, surveillance, and support provided by S&MA as necessary.

2.4.3 Develop program/project safety requirements in accordance with the requirements described in NPR 7120.5.

2.4.4 Support the MSFC SHE goals and objectives.

2.4.5 Include SHE requirements in contracts as in accordance with the requirements described in MWI 8715.9 and NFS Part 1823.70.

2.4.6 Coordinate with technical disciplines to ensure adequate review of program/project SHE-related activities during the planning, construction, testing and operation phases of new and modified facilities, equipment and processes.

2.4.7 Allocate adequate resources and delegate authority to ensure an effective SHE Program for their respective program/project.

2.5 Department/Office Managers/Branch Chief (Supervisor) shall:

2.5.1 Promote safety by setting a positive example by following the rules, wearing any required personal protective equipment, reporting hazards, reporting injuries and illnesses, and basically doing anything that they expect employees to do.

2.5.2 Be responsible and accountable for the safety of personnel and property under their control, with timely monitoring, surveillance, and support provided by S&MA as necessary.

2.5.3 Supervisor responsibilities are described in Chapter 1, “Supervisor General SHE Responsibilities.”

2.6 Director, S&MA shall:

2.6.1 Serve as the Safety Official for MSFC and MAF as designated by the CD.

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2.6.2 Promote safety by setting a positive example by following the rules, wearing any required personal protective equipment, reporting hazards, reporting injuries and illnesses, and basically doing anything that they expect employees to do.

2.6.3 Ensure an employee is designated to serve as Authority Having Jurisdiction (AHJ) for enforcing fire protection code and standard requirements at MSFC and MAF. See NASA-STD 8719.11 and NFPA.

2.6.4 Ensure the MSFC Industrial Safety Program is implemented in compliance with applicable Federal, NASA, and MSFC safety policies, regulations, and standards.

2.6.5 Ensure an independent assessment of safety issues and concerns is provided as needed.

2.6.6 Ensure safety policies, standards, and procedures to implement OSHA and NASA requirements are developed and implemented.

2.6.7 Ensure safety standards, instructions, and requirements applicable to MSFC operations are established and maintained; and make them available for employees to review.

2.6.8 Ensure technical assistance to line and staff managers to assist in accomplishing safety-related goals and objectives (including appropriate reference material sources), is provided.

2.6.9 Ensure records of safety trends and general status of the MSFC Industrial Safety Program are measured, analyzed, and maintained.

2.6.10 Support SHE Committee.

2.6.11 Ensure employee representatives are consulted in the implementation of the MSFC Safety Program. See 29 CFR Part 1960.12.

2.6.12 Ensure records are maintained of all occupational injuries and illnesses, submit reports to OSHA, and post annual summaries. See 29 CFR Part 1960 Subpart I.

2.6.13 Ensure safety and health program information is posted. See 29 CFR Part 1960.12.

2.6.14 Ensure evaluations of safety programs are performed for MSFC organizations and contractors. These evaluations can be conducted in the form of an audit in accordance with the requirements described in MPR 1280.6.

2.6.15 Ensure overview and surveillance are provided for activities identified as potentially hazardous or safety critical at MSFC and MAF.

2.6.16 Ensure reports of unsafe or unhealthful working conditions from employees are received, evaluated and a log of these reports is maintained. See 29 CFR Part 1960.28 and MWI 8715.13.

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2.6.17 Ensure a plan for industrial safety and fire prevention training is provided and implemented for managers, supervisors, employees, employee representatives, and safety and collateral duty safety personnel. See 29 CFR Part 1960.58.

2.6.18 Ensure safety plans, written operating procedures for hazardous or safety critical operations, hazard assessments, and other safety-sensitive documents and drawings are reviewed and approved. See MWI 8715.15.

2.6.19 Ensure OSHA, NFPA, NASA, and MSFC compliance inspections are conducted in accordance with the requirements described in 29 CFR 1960.26, NPR 8715.1 and MWI 8715.12. This includes all MSFC facilities and all facilities owned or leased by MSFC or occupied by MSFC civil service employees within the Huntsville, Alabama area. This also includes inspections of construction sites.

2.6.20 Ensure other sites owned or operated by MSFC or occupied by MSFC civil service employees (e.g., resident offices, MAF) have equivalent compliance inspections conducted by that site's local safety authority in accordance with the requirements described 29 CFR Part 1960.26.

2.6.21 Ensure facility safety tasks are performed at each phase of the facility life cycle, including concept development, design, procurement, construction, activation, operation, and disposal in accordance with the requirements described in NASA STD-8719.7, NPR 8715.3, MWI 8715.15, and MWI 8715.17.

2.6.22 Ensure compliance with applicable OSHA, NFPA, NASA, and MSFC safety policies, regulations, and standards.

2.6.23 Ensure all activities and facilities identified as potentially hazardous or safety critical are assessed for hazardous conditions and receive the necessary level of system safety and readiness review prior to initial startup and restart in accordance with the requirements described in NPR 8715.3, MWI 1700.2, MWI 8715.15, and MWI 8715.17.

2.6.24 Ensure activities/operations are halted or suspended where the potential exists to result in loss of life, serious injury/illness to personnel or public, or damage to property or the environment. The area supervisor is notified of these conditions and does not allow the activity/operation to resume until the condition has been corrected. The Contracting Officer is notified if the condition involves contractor activities/operations, if determined necessary.

2.6.25 Ensure all employees are provided with an equal and high-quality level of safety protection.

2.6.26 Ensure construction site processes located onsite are inspected/monitored for safety in accordance with the requirements described in NPD 8820.2, NPR 8715.3, Chapter 8, and MWI

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8715.12.

2.6.27 Ensure incidents and mishaps are entered, tracked and closed in IRIS. See NPR 8621.1 and MWI 8621.1.

2.6.28 Ensure safety-related training provided at MSFC and MAF is maintained up-to-date and provided by employees that are knowledgeable in the subject matter. See MPR 3410.1.

2.6.29 Ensure employees conducting hazard analysis, safety-related inspections and mishap investigations receive the necessary training to be knowledgeable in the subject matter.

2.6.30 Ensure there is close collaboration between S&MA and the Procurement Office to include safety and risk management consideration during the development, evaluation, and selection process for MSFC contracts in accordance with the requirements described in NPR 8715.3 Chapter 9 and MWI 8715.9.

2.7 EEOH Office shall:

2.7.1 Provide an Occupational Health Officer to serve as the Health Official for MSFC and MAF as designated by the CD.

2.7.2 Ensure the Occupational Health Services Program is implemented in accordance with the requirements described in MPR 1810.1 and MPD 1840.1.

2.7.3 Ensure compliance with applicable occupational health policies, regulations, and standards.

2.7.4 Ensure the MSFC Environmental Program is implemented in accordance with the requirements described in MPR 8500.1.

2.7.5 Ensure compliance with applicable environmental policies, regulations, and standards.

2.7.6 Ensure activities/operations are halted or suspended where the potential exists to result in loss of life, serious injury/illness to personnel or public, or damage to property or the environment. The area supervisor is notified of these conditions and does not allow the activity/operation to resume until the condition has been corrected. The Contracting Officer is notified if the condition involves contractor activities/operations, if determined necessary.

2.7.7 Ensure all employees are provided with an equal and high-quality level of health and environmental protection.

2.7.8 Ensure health and environmental-related training provided at MSFC and MAF is maintained up-to-date and provided by employees that are knowledgeable in the subject matter. See MPR 3410.1.

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2.7.9 Ensure employees conducting health and environmental related inspections receive the necessary training to be knowledgeable in the subject matter.

2.8 FMO shall:

2.8.1 Ensure that facilities are designed, constructed, operated, and maintained in accordance with the applicable documents, national standards, including ANSI, NFPA, and international standards as applicable. Where conflicting requirements exist, the most stringent are used.

2.8.2 If needed, obtain waivers/variances to code requirement. See NPR 8715.3, MPR 1410.2, and 3.1.15 of this MPR.

2.8.3 Ensure that construction work is performed in accordance with OSHA, 29 CFR Part 1926, and Alabama Department of Environmental Management (ADEM) Code R.335-6-7, and Louisiana Department of Environmental Quality (LDEQ) for MAF.

2.8.4 Ensure that facilities are maintained in accordance with the applicable codes and standards and the requirements of this MPR.

2.9 Office of Diversity and Equal Opportunity (ODEO) shall:

2.9.1 Assist supervisors and the Industrial Safety Branch (ISB) in identifying personnel that have special safety and health needs due to a physical disability.

2.10 MAF

2.10.1 The MSFC S&MA representative located at MAF shall:

2.10.1.1 Serve as the MAF Safety Official as delegated by the Director, S&MA.

2.10.1.2 Serve as the MAF Health Official as delegated by EEOH.

2.10.1.3 Serve as the MAF manager for Safety and Occupational Health.

2.10.1.4 Ensure the MSFC SHE Program requirements are implemented at MAF and comply with the applicable NPD/NPR/MPD/MPR/MWI that defines the requirement.

2.10.1.5 Ensure all of the functions and activities listed in this MPR for S&MA and ISB are performed. These functions and activities can be performed by the appropriate group of the Manufacturing Support and Facility Operations Contractor (MSFOC), if delegated by the MSFC S&MA representative.

2.10.1.6 Serve as the Point of Contact (POC) for S&MA at MAF for safety-related issues.

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2.10.1.7 Serve as the POC for EEOH at MAF for health-related issues.

2.10.1.8 Provide day-to-day support to MAF employees and residents for tasks listed in 2.6 applicable to safety-related activities.

2.10.1.9 Provide day-to-day support to MAF employees and residents for tasks listed in 2.7 applicable to health-related activities.

2.10.1.10 Provide input to MSFC S&MA on the status of the implementation of the MSFC SHE Program at MAF as requested.

2.10.1.11 Ensure an annual MAF SHE Program Plan is developed and approved by the MAF Chief Operating Officer and presented to the MSFC SHE Committee. See MC-12.

2.10.1.12 Provide the annual MAF SHE Program Plan to MSFC S&MA for inclusion into the annual SHE Program Plan as requested.

2.10.1.13 Assist the MSFC Office of Center Operations representative to ensure activities conducted at MAF comply with the MSFC SHE Program requirements.

2.10.1.14 Provide oversight, direction and assistance to the MSFOC in the day-to-day performance of activities and programs identified in sections 3.1 (CPR 1), 3.2 (CPR 2), 3.3 (CPR 3), 3.4 (CPR 4), and 3.5 (CPR 5).

2.10.2 The MSFC Office of Center Operations representative shall:

2.10.2.1 Ensure all of the functions and activities listed in this MPR for FMO and EEOH are performed. These functions and activities can be performed by the appropriate MSFOC group, if delegated by the MSFC Office of Center Operations representative.

2.10.2.2 Serve as the POC for FMO and EEOH in implementing the facility-related and environmental compliance responsibilities of the MSFC SHE Program at MAF.

2.10.2.3 Provide day-to-day support to MAF employees and residents for tasks listed in sections 2.7 and 2.8.

2.10.2.4 Provide input to MSFC Center Operations Office or NASA HQ on the status of MAF facilities and Environmental Compliance Program data as requested.

2.10.2.5 Assist the MSFC S&MA representative to ensure activities conducted at MAF comply with the MSFC SHE Program requirements.

2.10.2.6 Provide oversight, direction and assistance to the MSFOC in the day-to-day

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performance of activities and programs identified in sections 3.1 (CPR 1), 3.2 (CPR 2), 3.3 (CPR 3), 3.4 (CPR 4), and 3.5 (CPR 5).

2.10.3 The MSFOC shall:

2.10.3.1 Perform the day-to-day activities and programs identified in sections 3.1 (CPR 1), 3.2 (CPR 2), 3.3 (CPR 3), 3.4 (CPR 4), and 3.5 (CPR 5) as directed by the MSFC S&MA representative and/or MSFC Office of Center Operations representative.

2.10.3.2 Obtain assistance from the MSFC S&MA representative and/or MSFC Office of Center Operations representative as needed.

2.10.4 MAF SHE Committee.

2.10.4.1 MAF shall implement a committee similar to the MSFC SHE Committee with the roles, responsibilities, and operation equivalent to that of the SHE Committee described in MC-12, as determined by the MAF manager of Safety and Occupational Health. See sections 2.11 and 2.10.1.

2.11 SHE Committee

2.11.1 SHE Committee responsibilities are described in the Committee's Charter, MC-12 in accordance with the requirements described in MPD 1150.1.

2.11.2 The SHE Committee can be contacted for assistance in correcting hazardous conditions that cannot be corrected or funded through the organization's normal chain of command. See 3.1.9.

2.12 AM/BM

2.12.1 AM/BM responsibilities are described in MWI 8715.5.

2.13 Contractors and Other Non-civil Service Personnel

2.13.1 Contractors and other non-civil service personnel are considered part of the MSFC and MAF Team and play a critical role in the MSFC SHE Program. At a minimum, they shall follow the same SHE rules and regulations as MSFC and MAF civil service employees as described in this MPR, Chapters 2, 3, and 4.

2.13.2 Contractor management and employee responsibilities shall be similar to the civil service team responsibilities above, and documented in the contractor's SHE Plan approved by MSFC. Their companies may impose additional SHE rules.

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2.13.3 Contractors and other non-civil service personnel discovered not following SHE rules shall be reported to the Contracting Officer (CO) and subject to the disciplinary system described in their respective company policies or the MSFC disciplinary program as determined by the CO and the respective company.

2.13.4 Contractor employees shall be provided a method/process to report hazardous conditions in their work areas to their management. They can elect to use and follow the process described in MWI 8715.13.

2.13.5 Contractors shall report safety matrix information to S&MA to the extent specified in their contract.

2.13.6 Contractors shall provide training to their employees and obtain any MSFC or MAF certification required to perform an operation or process that requires a certification to the extent specified in their contract.

2.13.7 Contractors and other non-civil service personnel shall ensure operations and processes they perform are compliant with the MSFC Quality Management System requirements for the specific operation or process to the extent specified in their contract. See MPD 1280.1 and the specific MSFC or MAF directive for the operation or process.

2.14 Employees.

2.14.1 Employee responsibilities are described in Chapter 2, “Employee General SHE Responsibilities.”

2.15 Personnel Who Are Not Contractors.

2.15.1 Personnel who are not contractors, yet allowed access to MSFC facilities to conduct individual research or other activities under grants or other auspices, shall comply with all the requirements of the MSFC SHE Program including:

2.15.1.1 Completing the SHE training identified as required by the SHE Training Assessment. This training is identified by the supervisor or designee by completing the SHE Training Assessment located on the Supervisor Safety Web page (SSWP). The SSWP can be accessed from the MSFC SHE Web page. Access to the SSWP is password protected. For access, contact ISB.

2.15.1.2 Obtaining MSFC SHE training and certifications in accordance with the requirements described in MWI 3410.1 when performing jobs or tasks that require an MSFC or MAF certification.

2.15.1.3 Submitting a written SHE Plan in accordance with Data Requirement Document Standard/Safety-Safety & Health Plan (DRD STD/SA-SHP) or Data Requirement Document

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Standard/Alternate Safety-Safety, Health & Environmental Plan (DRD STD/SA-ASHE) to S&MA for approval prior to starting work, if their activities are potentially hazardous to personnel or property. These DRDs are available via the MSFC Integrated Document Library or from the Office of Procurement.

2.15.1.4 Reporting mishaps and other safety data in accordance with the requirements described in MWI 8621.1.

2.16 Marshall Safety and Health Action Team (MSAT)

2.16.1 MSAT is a team formed by Marshall employees and Marshall contractor employees to provide the Center with an independent “bottoms up” approach to safety and health. MSFC civil servants, contractor employees and their unions join MSAT to promote a safe and healthy work environment and to promote an attitude to accomplish our work safely.

2.16.2 Additional information can be obtained from the MSAT Web page. The MSAT Web page can be accessed from the MSFC SHE Web page, select “Committees and Teams,” then “MSAT.”

3. PROCEDURE

The MSFC SHE Program has five Core Program Requirements (CPRs). Four of the five MSFC CPRs match directly to the OSHA Voluntary Protection Program (VPP) CPRs as the foundation requirements of a desired safety and health program. The four CPRs have been identified by OSHA as the criteria necessary to establish the foundation for a safety and health program that strives to promote and provide a workplace that is (1) incident and injury free by (a) preventing employee fatalities; (b) reducing the number of incidents; and (c) reducing the severity of employee injuries and illnesses for all employees. The four CPRs identify the elements needed to develop a management and employee culture that is proactive toward the safety and health of others and the technical processes necessary to identify hazards in the workplace and have them corrected before they can cause an injury to employees. MSFC added an additional CPR for Environmental Compliance for the protection of the environment. See Appendix C for a listing of the OSHA VPP elements and sub-elements that make up each CPR. MSFC implements these CPRs as described in the following:

3.1 CPR 1 - Management Leadership and Employee Involvement.

3.1.1 Management Commitment and Leadership.

3.1.1.1 MSFC is committed to establishing, documenting, and communicating a safety management system that provides (1) clear goals that are attainable and measurable; (2) objectives that are relevant to workplace hazards; (3) trends of workplace injuries and illnesses; and (4) includes policies and procedures that indicate how MSFC can accomplish these objectives and meet these goals.

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3.1.1.2 MSFC is committed to establishing safe and healthful working conditions and providing employee protection against hazards by implementing and maintaining the NASA General Safety Program Requirements and the four major elements of the OSHA VPP – (1) Management Leadership and Employee Involvement; (2) Worksite Analysis; (3) Hazard Prevention and Control; and (4) Safety, Health and Environmental Training.

3.1.1.3 MSFC’s management commitment to the MSFC SHE Program is documented in each section of this MPR and the MSFC applicable documents listed in section P.4.

3.1.1.4 Approval of this MPR by the MSFC Center Director signifies MSFC’s management commitment to the MSFC SHE program at every level of MSFC management and communicates this commitment to all employees.

3.1.1.5 This MPR and the documents listed in the applicable documents listed in section P.4 document the MSFC SHE program.

3.1.1.6 This MPR along with the authority documents listed in section P.3 and the applicable documents listed in section P.4 identify the processes that MSFC implements to ensure safety and health is integrated into the general planning for day-to-day activities and during the purchasing and contracting activities to have services conducted by someone other than NASA at MSFC and MAF.

3.1.1.7 SHE Policy.

- a. Safety: MSFC strives to prevent human injury and ensure the safety of all operations and products in support of mission success.
- b. Health: MSFC strives to prevent occupational illnesses and to promote and maintain the physical and mental well-being of its employees to help ensure mission success.
- c. Environmental: Enabling NASA’s mission by providing environmental compliance and stewardship and a safe and healthful workplace.

3.1.1.8 SHE Vision.

- a. Center Safety and Health Vision:
 - (1) No safety or health-related injuries.
 - (2) No safety-related property damage.
 - (3) No public injuries or illnesses.

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(4) Full compliance with OSHA requirements for chemical handlers.

(5) Excellent participation in medical monitoring program

b. Center Environmental Vision:

(1) The Center environmental visions are described in MPD 8500.1.

3.1.1.9 SHE Goals: The SHE goals are documented in the Annual SHE Program Plan and each directorate/office shall strive to help MSFC achieve and fulfill these goals. See MCP 8715.1.

3.1.1.10 The agreement between George C. Marshall Space Flight Center and Marshall Engineers and Scientists Association (MESA) Article 19 lists the safety and health provisions that apply to MESA.

3.1.1.11 The agreement between George C. Marshall Space Flight Center and the American Federation of Government Employees (AFGE) Agreement Article 39 provides the safety and health provision that apply to AFGE.

3.1.2 Manager and supervisor responsibility and accountability.

3.1.2.1 Managers and supervisors shall be held responsible and accountable for meeting the SHE Program responsibilities through the implementation of a performance evaluation system.

3.1.2.2 Managers and supervisors shall ensure that a SHE element is included in each employee's performance plan and is reviewed semiannually between employees and their immediate supervisor.

3.1.3 Employee accountability.

3.1.3.1 Employees shall be held responsible and accountable to follow the SHE Program rules established by this MPR.

3.1.3.2 Contractors shall implement a similar responsibility and accountability process as defined in their approved SHE Plan.

3.1.4 Managers and Supervisors Involvement.

3.1.4.1 Managers and supervisors play a key role in SHE Program implementation as indicated by the supervisors' SHE responsibilities which are described in Chapter 1, "Supervisor General SHE Responsibilities."

3.1.4.2 Managers and supervisors are encouraged to participate in the SHE Committee and appropriate SHE Subcommittees. In addition, section 3.1.9 provides supervisors' requirements for conducting SHE meetings and rewarding employees for SHE accomplishments.

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3.1.5 Employee involvement.

3.1.5.1 Employee involvement and engagement in the MSFC SHE Program are other key ingredients as indicated by the employee responsibilities described in Chapter 2, “Employee General SHE Responsibilities.” Each employee is encouraged to actively participate and be engaged in the SHE Program in at least three meaningful, constructive ways.

3.1.5.2 Employees involvement and engagement in the SHE Program can include, but not limited to, any of the following: (1) attending monthly SHE Committee meetings; (2) membership on SHE Subcommittees or teams; (3) participating in SHE audits; (4) participating in supervisor worksite SHE visits; (5) participating in a mishap investigation; (6) participating in the development of a hazard analysis or JHA; (7) participating in a readiness review for the startup of a facility or operation; (8) submitting safety concerns by use of the safety concern reporting system; (9) submitting suggestions for improvements to the SHE program by use of the employee feedback systems; (10) serving as a BM or ABM; providing presentations at SHE or safety meetings; (11) providing SHE training; or (12) participating in organization or team safety activities and initiatives.

3.1.6 Contractors and other non-NASA personnel involvement and engagement in the SHE Program.

3.1.6.1 Contractors and other non-NASA personnel working at MSFC or MAF shall be provided with safe and healthful working conditions and the same level of employee protection against hazards as those described in this MPR.

3.1.6.2 Contractor selection is conducted in accordance with the process and requirements described in MWI 5100.1 and MWI 5115.2.

3.1.6.3 Contractor SHE Plans or Alternate SHE Plan for these personnel shall comply with DRDs STD/SA-SHP or STD/SA-ASHE or other specifications placed in their contracts that define the SHE requirements as appropriate. DRDs are not placed in construction contracts, so a slightly different process is used for placing SHE requirements in construction contracts. Contact FMO or ISB for more information on this process.

3.1.6.4 Contractors are encouraged to participate and be engaged in the Contractor Safety Forum, SHE Committee, SHE Subcommittee and also any of the activities in 3.1.5.2.

3.1.6.5 Oversight of contractor safety and health performance is performed as specified in their contract. See MWI 8715.9.

3.1.6.6 SHE requirements are included in contract solicitations and evaluated in accordance with the processes and requirements described in MWI 8715.9.

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3.1.7 AM/BM Involvement.

3.1.7.1 The AM/BM program functions are to assist managers/supervisors, S&MA, EEOH and FMO provide and maintain a safe and healthful work place throughout the Center and improve SHE-related activities. The AM/BM program is implemented in accordance with the requirements described in MWI 8715.5.

3.1.7.2 At MAF, the AM/BM program function is implemented using a similar process that also includes the use of supervisors assigned to specific areas within buildings to be the POC to resolve facility-related issues.

3.1.8 Authority.

3.1.8.1 Authority shall be given to managers/supervisors to reduce the degree of hazardous conditions that have the potential to result in loss of life, serious injury/illness to personnel or public, or damage to property or the environment. This authority allows them to implement interim controls or stop the operation/process/activity when the hazardous conditions cannot be corrected in a reasonable time.

3.1.8.2 Authority shall be given to all employees to stop any operation that they feel has the potential to result in loss of life, serious injury/illness to personnel or public, or damage to property or the environment. This authority allows them to take appropriate action if an unsafe act or condition exists, report it to management, and ensure subordinates are aware of their responsibility and authority to do the same.

3.1.8.3 Authority shall be given to all employees to stop any test activity or operation when the test or operation is discovered to be operating outside the pre-established safety parameters for the test or operation. This includes stopping the test or operation when unexpected data is received and is determined to be outside of the pre-established safe operating range of the test or operation.

3.1.8.4 When a test or operation is stopped, it shall not be restarted until an investigation is conducted to determine the cause of the unexpected data.

3.1.8.5 This authority is often referred to as “stop work authority” and is intended to only stop the portion of the operation where the unsafe act or condition exists.

3.1.9 Resources.

3.1.9.1 Resources shall be provided by MSFC to correct conditions identified as hazardous and that pose a potential for employee injury or illness. These resources include for correction of emergency conditions when necessary. These conditions can be identified during SHE inspections, audits, or by employee concerns.

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3.1.9.2 Hazardous conditions directly related to maintenance of a building can be corrected by initiating a Trouble Call (TC) for minor repairs or a Facilities Work Request (FWR) to the Facilities Work Control. Details on these processes can be obtained from the Center Operations Web page located on Inside Marshall. At MAF, contact the Work Control Center (WCC). Contact FMO if more information is needed on this process.

3.1.9.3 Hazardous conditions that are not related to maintenance of an MSFC or MAF building are normally the responsibility of the MSFC or MAF organization assigned to the area or responsible for the operation/activity. MSFC provides funding for these situations which can be obtained through the organization's normal chain of command.

3.1.9.4 Contact the ISB for assistance in correcting hazardous conditions if necessary. At MAF, contact the manager of Safety and Occupational Health, or MSFC Office of Center Operations representatives located at MAF or MSFOC.

3.1.9.5 The SHE Committee shall be contacted for assistance in correcting hazardous conditions that cannot be corrected or funded through the organization's normal chain of command.

3.1.10 Professional Safety and Health Staff.

3.1.10.1 S&MA and Center Operations shall include safety and health professionals who provide SHE-related services to all Center employees as needed, and promote and communicate SHE goals and objectives across the Center. Contractor organizations can also include safety and health professionals. They can be required by contract or MSFC-approved Safety and Health Plan.

3.1.10.2 At MAF, the MSFOC provides this staff.

3.1.11 SHE Monthly Meetings.

3.1.11.1 Supervisors at all levels shall conduct and document monthly SHE meetings with those employees that report directly to them.

3.1.11.2 The SHE meeting shall include discussion on the recommended SHE focus topics listed in the Supervisor Safety Web Page (SSWP), if any, and can be incorporated into a regular staff meeting, or be combined with a manager's or other supervisory meeting.

3.1.11.3 In cases where employees are assigned in an organization remote from their official supervisor, the employees can attend the SHE meetings of the remote organization in place of their official organization. The official supervisor can document the employee's participation in the SHE meeting of the remote organization in SSWP by adding a comment similar to the following: John Doe attended the EM20 safety meeting this month.

3.1.11.4 SHE meetings normally include the following, as applicable:

**CHECK THE MASTER LIST at <https://repository.msfc.nasa.gov/directives/directives.htm>
VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE**

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- a. Discussion of results of SHE inspection findings and necessary corrective actions.
- b. Discussion of recent mishaps, including close calls and corrective actions.
- c. Discussion of current SHE issues and concerns, including subjects identified at other levels of the organization. Discussion of any assigned SHE program corrective actions.
- d. Presentation of SHE topics relevant to the work or home, including, as a minimum, any required topics listed on the SSWP.
- e. Recent safety bulletins or other information posted on SHE Web page.
- f. Specific SHE Training required for work area(s) or process(es).

3.1.11.5 Record of the SHE meeting can be maintained in the SSWP.

3.1.12 Safety Awards.

3.1.12.1 Employee and Employee Team Awards. MSFC is committed to continued improvement of safety in all operations. The presentation of awards is considered appropriate for recognizing outstanding safety-related contributions and is an effective means of encouraging safety excellence. MSFC’s Space Flight Safety Awards Program is described on the “MSFC Space Flight Awareness” Web page. The link can be found on the “Center Organizational Web sites” on Inside Marshall Web site under the Office of Strategic Analysis and Communications links. Nomination criteria and forms are also listed at this site.

3.1.12.2 Awards available to recognize individuals/teams who have contributed to MSFC’s Safety Program are shown in Award Table 1.

Award Table 1

a. Silver Snoopy Award	d. Honoree Award
b. Team Award	e. Leadership Award
a. Flight Safety Award	f. Safety Excellence Award

3.1.12.3 Organization Awards. Onsite organizations that meet or exceed the benchmark set by MSFC for the peak elapsed time or cumulative exposure hours without significant mishap, or make other special achievements, shall be recognized with presentation of an award described in the table below. These awards are presented at the civil service directorate/office level or contractor level.

3.1.12.4 Awards available to recognize a civil service directorate/office level or contractor level are shown in Award Table 2.

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Award Table 2

Achievement	Award
	Hours Worked Without a Lost Time
a. 1,000,000 Hours or 5 Years (whichever comes first) Without Lost Time or Property Damage Mishap Exceeding \$25,000	Plaque Presented by Center Director at Marshall Team Meeting.
b. 5,000,000 Hours or 10 Years (whichever comes first) Without Lost Time or Property Damage Mishap Exceeding \$25,000	Plaque Presented by Center Director at Special Ceremony for All Organization Employees. Memento for each employee.
c. 10,000,000 Hours or 20 Years (whichever comes first) Without Lost Time or Property Damage Mishap Exceeding \$25,000	Trophy Presented by NASA Administrator (if possible) or Center Director at Special Ceremony for All Organization Employees. Memento for each employee.
	Superior Safety Performance
d. Prime Contractor with a verified Annual Average Self-Evaluation Score of 36 or Higher and a Lost Time Case rate at least 50% less than North American Industry Classification System Average	Plaque Presentation by Center Director at Marshall Team Meeting.

3.1.12.5 To request consideration for one of the awards identified in Award Table 2, the contractor shall submit a formal request to their CO for consideration of one of the awards listed.

a. The contractor shall provide all documentation necessary to the CO and ISB, when requested, to support the award being requested. The supporting documentation can include, but not limited to, copies of the Contractor's annual self-evaluation, contractor's OSHA 300 Logs, or other documentation that acknowledges the contractor has fulfilled the requirements for safety award. See MSFC 52.223-94.

b. The CO shall review the supporting documentation, and if they agree, forward the supporting document ISB for review and concurrence.

c. ISB shall evaluate the supporting documentation and notify the CO of their concurrence or non-concurrence with the award nomination.

d. If ISB non-concurs with the award nomination, ISB shall provide rationale to the CO.

e. If ISB concurs with the award nomination, ISB shall prepare the appropriate award certificate and notify the CO to notify the contractor.

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f. The awards are normally given to the contractor at an MTM, but can also be provided directly to the contractor by the CO or ISB if deemed appropriate.

g. Contractors shall not submit a request for these awards directly to ISB. See 3.1.15.5.a.

3.1.12.3 The awards listed in Award Tables 1 and 2 are also available to employees and contractors at MAF.

3.1.12.4 Employees can be nominated to receive a “Caring in Action” award given by the MSAT. Information on how to nominate someone for this award can be found on the MSAT Web page located on the MSFC SHE Web page, select “Committees and Teams,” then “MSAT.” See 2.16.

3.1.13 SHE Program Evaluation.

3.1.13.1 The SHE Committee shall ensure an evaluation of the MSFC SHE Program is conducted to determine the overall effectiveness of the MSFC safety and health management system.

3.1.13.2 The evaluation shall be conducted at least annually and is normally accomplished by an internal or external audit of the SHE Program. The evaluation can be conducted on a more frequent basis if determined necessary by the SHE Committee. The evaluation can be conducted in the form of an audit in accordance with the requirements described in MPR 1280.6.

3.1.13.3 The evaluation shall be a review of all or a portion of the SHE program elements recommended by the SHE Committee or only those identified by the managers of ISB and EEOH, as necessary.

3.1.13.4 The evaluation shall include any of the following: (1) reviewing and assessing data obtained from SHE-related activities such as results from SHE Inspections, SHE audits, employee feedback, and concerns brought forth to the SHE Committee; (2) walk-through of the workplace and interviews with employees; (3) results of mishap investigations; and (4) other SHE-related data as deemed necessary.

NOTE: If deemed appropriate by the SHE Committee, the annual self-evaluation can be conducted following the OSHA safety and health program evaluation process described in NPR 8715.1, CH 8 or CSP 03-01-003.

3.1.13.5 The results of this evaluation shall be forwarded to the SHE Committee for inclusion into MSFC annual assessment.

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3.1.13.6 Each year S&MA obtains feedback on the effectiveness and root level understanding of the SHE Program from employees. Employees can provide their views on the effectiveness of the SHE program by using the “SHE Feedback” located on the SHE Web page on Inside Marshall.

3.1.13.7 Organizations identified to have issues specific to their organization shall establish corrective action plans to address these issues and submit these plans to S&MA within 6 weeks of receiving the survey results. These plans are often referred to as “get well plans.”

3.1.13.8 S&MA shall ensure corrective actions for generic cross-Center issues are included in the Annual SHE Program Plan.

3.1.13.9 S&MA and EEOH shall conduct audits of their respective areas within the SHE program in accordance with the audit schedule determined by their respective office to ensure compliance with this MPR. These audits include random visits to MAF to support the manager of Safety and Occupational Health and MSFC Office of Center Operations representative to ensure compliance with the requirements contained in this MPR.

3.1.13.10 To reduce operational impact, these audits can be conducted in conjunction with the Marshall Management System internal audits, when possible.

3.1.13.11 Contractor work areas identified to have (1) an increased potential for a fire to ignite; (2) include operations identified to contain high or moderate risks for employee injury or illness, property damage due to the nature of work being performed; or (3) perform operations that involve the use of chemicals, or generate hazardous waste are subject to more frequent SHE program evaluations conducted by ISB and/or EEOH.

3.1.13.12 At MAF, the MSFOC assists the manager of Safety and Occupational Health and MSFC Office of Center Operations representative in conducting this evaluation.

3.1.14 Annual SHE Program Plan. See MCP 8715.1

3.1.14.1 Each year S&MA shall prepare an Annual SHE Program Plan for the upcoming year with the support from Center Operations, Office of Human Capital, and the SHE Committee.

3.1.14.2 The Annual SHE Program Plan shall include the following, at a minimum:

- a. SHE Program goals
- b. SHE Program audit findings discovered during the previous year’s SHE Program audit, including the proposed corrective action and assignee, as necessary.
- c. SHE Program improvements, including the assignee, as necessary.

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d. Be presented for approval to the SHE Committee and Center Management. Normally, this is scheduled for the regular November meeting.

e. Be approved and signed by the MSFC Center Director.

3.1.14.3 Actions assigned to organizations for the correction of any findings and/or for improvement of the SHE Program along with the assignee and the target completion date for each shall be tracked to closure. These actions can be maintained in an electronic database.

3.1.14.4 At MAF, the Annual MAF SHE Program Plan shall be approved by the MAF Chief Operating Officer and contain the elements required by 3.1.14.2.

3.1.14.5 A copy of MAF SHE Program Plan shall be forwarded by the manager of Safety and Occupational Health to MSFC S&MA for inclusion in Annual SHE Program Plan at MSFC, when requested.

3.1.15 Request for Relief from Safety Requirements Process.

3.1.15.1 The basic concept for requesting a request for relief is for the system/operation owner to evaluate the system/operation to determine if all requirements for safe operation of the system/operation can be met. For those requirements that cannot be met, the system/operation owner shall perform the following: (1) prepare a request for relief to the requirements; (2) route the request through any offices/departments necessary for concurrence; and (3) route the request to the Directorate/Office directly responsible for the requirement.

NOTE: The Directorate/Office directly responsible for the program, project, operation or process requirement, is the best to determine whether a variance to the requirement can be obtained without a negative impact.

3.1.15.2 When requesting relief, the system/operation owner having direct responsibility for implementing the safety requirements is accepting the risks associated with the request for relief and shall implement all actions necessary to provide alternate means that provide an equivalent or lower level of risk, and ensure the operation does not present undue risk to public health, safety, the environment, or personnel.

3.1.15.3 Request for relief shall be requested and approved on a case-by-case basis. See NPR 8715.3 and MPR 1410.2.

3.1.15.4 Request for relief to safety-related Federal, state or local regulatory requirements, or to safety-related consensus standards imposed by regulation (e.g., OSHA, or NFPA) shall be requested in accordance with the process described by the regulatory office responsible for the requirement and through the appropriate NASA HQ/MSFC Directorate/Office in accordance with the requirements described in NPR 8715.3.

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3.1.15.5 Request for relief to SHE-related requirements contained in NASA or MSFC SHE-related directives (NPDs, NPRs, MPDs, MPRs, and MWIs) shall be requested in accordance with the requirements described in MPR 1410.2 or in accordance with a variance approval process defined in an approved MPD/MPR/MWI for a given system/operation or specific process.

3.1.15.6 Request for relief to safety-related requirements contained in Program or Project documentation shall be in accordance with the Program/Project defined processes and the requirements described in NPR 8715.3.

3.1.15.7 Operations that contain high or moderate risk of injury to employees shall be halted until the request for relief is approved, or the problem is corrected and regulatory compliance can be achieved.

3.1.15.8 Request for relief request from health and environmental-related issues shall be requested in accordance with this variance process or a variance process defined by EEOH.

3.1.15.9 At MAF, request for relief request for SHE requirements shall be routed through the manager of Safety and Occupational Health or MSFC Center Operations Office representative located at MAF prior to forwarding on to MSFC S&MA or MSFC EEOH for processing and approval.

3.2 CPR 2 - Worksite Analysis.

3.2.1 Hazard Assessment.

3.2.1.1 Each organization shall evaluate all new and existing facilities, processes, operations, and jobs to ensure the appropriate level of hazard assessment is conducted and documented in accordance with the requirements described in MWI 8715.15.

3.2.1.2 The level of hazard assessment required shall depend upon the level of risk to employee or property when operating a facility or performing a process, operation, or job. This is normally a detailed hazard analysis for facilities, processes, operations, and jobs perceived to have a high or moderate level of risk and a less detailed job hazard analysis for those perceived to have a low or minimal level of risk.

3.2.1.3 When a hazard assessment is conducted, it shall clearly identify the potential hazards, concerns or undesired events associated with the process, operation or job and the recommended corrective actions to eliminate, control or mitigate the hazard, concern or undesired event.

3.2.1.4 Hazard assessments shall be updated when substantial modifications are made that potentially affect the safe operation of the facility, equipment, operation, process, or job, or the safety measures implemented by a previous hazard assessment have been modified and are viewed to have potentially increased the perceived level of risk in accordance with the

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requirements described in MWI 8715.15.

3.2.1.5 Supervisors shall ensure employees are aware of and review the job hazard analysis conducted for the specific processes, operations and jobs they are to perform in accordance with the requirements described in MWI 8715.15.

3.2.1.6 Supervisors shall ensure facilities and operations receive the necessary level of readiness review prior to initial startup or restart in accordance with the requirements described in MWI 8715.17.

3.2.1.7 The initial assessment for any facility, process, operation, or job shall be considered as its baseline assessment.

3.2.2 Routine Self-Inspections.

3.2.2.1 Supervisors and managers shall conduct regular safety and health inspections, and document and track the hazards in the SSWP until corrected. See MWI 8715.16.

3.2.2.2 Supervisors and managers shall conduct and document monthly SHE visits and initiate appropriate corrective action for potentially-unsafe conditions and actions in accordance with the requirements described in MWI 8715.16.

3.2.2.3 AM and BM or their designated alternates shall conduct and document inspection of the common areas of assigned facilities and grounds and initiate appropriate corrective action for potentially-unsafe conditions and actions in accordance with the requirements described in MWI 8715.5. These inspections are conducted at least monthly. See MWI 8715.5.

3.2.2.4 ISB and EEOH shall conduct safety and health inspections of facilities, buildings, areas and operations, and document these inspections by tracking the hazards until corrected in accordance with the requirements described in MWI 8715.12.

3.2.2.5 At MAF, the MSFOC shall conduct the safety and health inspections following the requirements contained in MWI 8715.12.

3.2.2.6 ISB and EEOH inspections include the following:

- a. New, refurbished, or leased facilities shall be inspected by S&MA prior to NASA employee occupancy.
- b. All safety issues shall be documented and satisfactorily resolved prior to occupancy.
- c. For leased facilities, a safety inspection shall be conducted prior to signing a lease agreement.
- d. All safety issues shall be documented and satisfactorily resolved prior to signing lease

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agreements.

e. ISB shall conduct (1) annual comprehensive safety inspection of all MSFC facilities including those in an inactive status; (2) semi-annual inspections of all facilities identified to have an increased potential for a fire to ignite, or include operations identified to contain high or moderate risks for employee injury or illness, or property damage due to the nature of work being performed; and (3) weekly construction site safety inspections in accordance with the requirements described in 29 CFR Part 1960.26 and NPR 8715.1. At MAF, these inspections are conducted by the MSFOC.

f. ISB shall coordinate with the MAF S&MA manager of Safety and Occupational Health and conduct random safety inspections at MAF.

g. Inspections shall be performed by ISB, EEOH, and MSFOC inspectors and/or other employees that have received sufficient training and have experience to recognize, evaluate, and provide general recommendations in resolving workplace hazards, as defined in 29 CFR Part 1960.2 and NPR 8715.1, Chapter 4.

h. Inspection records shall be maintained in accordance with section 4 of this MPR.

3.2.3 Unsafe Condition Reporting System for Employees.

3.2.3.1 Employees can report unsafe working conditions or hazards in the workplace using the MSFC SCRS described in MWI 8715.13. Employees can submit their concerns into this system without fear of reprisal or they can elect to remain anonymous. This reporting system provides feedback on the action taken and status to the employee that submitted the concern, if the employee's name is provided. All concerns that are submitted into the SCRS system are tracked till closure. See 29 CFR Part 1960.28 and NPR 8715.1, Chapter 4.

3.2.3.2 S&MA shall ensure NASA HQ is notified when a safety concern is received related to a NASA program or activity in accordance with the requirements described in MWI 1700.3.

3.2.4 Industrial Hygiene (IH) Program.

3.2.4.1 The IH program is to provide employees at MSFC and MAF with an environment in which occupational health hazards are identified, evaluated, eliminated, and/or controlled in such a manner that personnel do not suffer adverse health effects as a result of their employment in accordance with the requirements described in MPD 1840.1.

3.2.5 Mishaps/Close Calls Investigated and Hazards Corrected.

3.2.5.1 All mishaps and close calls shall be reported, investigated, and documented to determine the proximate or root cause(s) in order to develop and implement the appropriate corrective and/or preventive action to prevent recurrence in accordance with the requirements described in

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MWI 8621.1.

3.2.5.2 Government-owned or leased motor vehicle accidents are investigated in accordance with the requirements described in MPR 6700.1.

3.2.5.3 ISB shall ensure management is notified of mishaps/close calls by phone call and/or distributing an intranet e-mail message. This notification normally includes an initial notification of what happened with a follow-up notification with additional information gathered during the initial investigation.

3.2.5.4 At MAF, the S&MA manager of Safety and Occupational Health shall ensure MSFC S&MA is notified of any mishaps/close calls that occur at MAF.

3.2.5.5 ISB notifies the general population of recent mishaps and close calls by posting a safety bulletin on the SHE Web page that includes a description of what happened, the proximate or root cause(s) and what could have done to prevent the mishap or close call from reoccurring and/or the lessons learned from the mishap/close call. The safety bulletins can be obtained from the SHE Web page under the “News & Information” pull down menu. More detailed information of the mishap or close call can be obtained from the SHE Web page under the “Mishap, Questions & Concerns” pull down menu. Select the “Personnel Mishap/Close Call Listing.”

3.2.5.6 ISB shall ensure safety bulletins are provided to supervisors for discussion with employees during monthly SHE meetings. These are normally provided to the supervisor via the SSWP.

3.2.5.7 ISB shall ensure the organizations directly responsible for the area where a mishap/close call occurred that are evaluated to be a type C or worse mishap and high-visibility and significant close-calls present to the SHE Committee in accordance with the requirements described in MWI 8621.1. The presentation is to provide details of how the mishap/close call occurred and what measures are being implemented to prevent it from reoccurring. The SHE Committee can request the presentation also be made to the MTM.

a. Mishaps that occur at MAF shall be presented to the MAF SHE Committee when determined necessary by the S&MA manager of Safety and Occupational Health or MAF SHE Committee. In some cases, the MAF mishaps can be requested to be presented to the SHE Committee at MSFC. Contact ISB or the S&MA manager of Safety and Occupational Health located at MAF for more information.

3.2.5.8 The responsible organization’s report shall include the following, at a minimum: (1) the description of what happened; (2) the proximate or root cause(s); (3) what can be done to prevent the mishap/close call from reoccurring; and/or (4) the lessons learned from the mishap/close call.

3.2.5.9 Employees can contact ISB to obtain additional information concerning specific control

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measures implemented for a mishap/close call.

3.2.5.10 Alerts that can affect SHE are distributed in accordance with the requirements in MWI 1280.5.

3.2.6 Injury, Illness, and Close Call Trend Analysis.

3.2.6.1 ISB shall analyze injury, illness, and close call data, and identify any significant trends in accident experience.

3.2.6.2 Trend analysis data shall be presented to the SHE Committee and regularly to the Center management at the MTM, and be posted on the SHE Committee Web page located on the SHE Web page.

3.2.6.3 Trend analysis results shall be used to guide planning of accident prevention strategies and programs.

3.2.6.4 ISB shall post the OSHA Summary of Work-Related Injuries and Illnesses (OSHA Form 300) reports for the general population's view. This is normally posted on the main bulletin board in the basement of Building 4200 and the lobby of 4203 and on the SHE Web page.

3.2.6.5 At MAF, the OSHA Summary of Work-Related Injuries and Illnesses (OSHA Form 300) is posted in locations identified by the S&MA manager of Safety and Occupational Health.

3.2.6.6 ISB shall complete and provide an Annual OSHA Report to the DASHO after it has been received from HQ. This report is part of an Agency-wide report that is provided to the Secretary of Labor. See NPR 8715.1 Chapter 7.

3.3 CPR 3 - Hazard Prevention and Control.

3.3.1 Professional Resources.

3.3.1.1 A staff of safety and health professionals and licensed health care professionals shall be maintained to ensure the effective implementation of systems for hazard prevention and control at MSFC and MAF. Support from safety and health professionals is also provided from NASA Headquarters and other NASA sites.

3.3.1.2 At MAF, the MSFOC provides this staff. Contact the S&MA manager of Safety and Occupational Health for assistance if needed.

3.3.2 Hazard Elimination and Control Methods.

3.3.2.1 The type of hazards, their potential severity and frequency of occurrence and the risk the hazards pose to employees and property shall be considered when determining the methods of

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prevention, elimination, and control in accordance with the requirements described in MWI 8715.15.

3.3.2.2 Hazardous conditions that cannot be corrected on the spot and are temporary in nature shall be identified. The identification can be accomplished by any method deemed appropriate for the hazard such as placing cones or barricade pedestals with retractable barricade strap, or erecting a temporary barricade to alert other employees of wet floors in accordance with the requirements described in MWI 8715.3.

3.3.2.3 Hazardous conditions that cannot be corrected by engineering design or by the incorporation of safety devices and guards and pose a risk of personnel injury shall require the use of personal protective equipment (PPE) in accordance with the requirements described in MWI 8715.4.

3.3.2.4 Operations identified as potentially hazardous and contain a high risk or moderate risk for employee injury or illness shall be kept isolated or separated from the general workforce and locations identified as office areas. Operations identified to contain a low risk for employee injury or illnesses are also recommended to be separated from locations identified as office areas. Contact ISB for assistance as necessary.

3.3.2.5 Hazard Mitigation Hierarchy. Hazards shall be eliminated, controlled or mitigated in the following order of precedence:

- a. Engineering Controls - Design to physically eliminate, isolate or minimize the hazard.
- b. Safety Management Programs - Incorporate protective safety guards and warning devices.
- c. Administrative Controls - Develop operating procedures and training to significantly limit exposure to the hazard. Require the use of PPE when all other hazard controls have been exhausted.

3.3.2.6 Additional Administrative Controls. Center instructions developed to address SHE administrative controls include:

- a. Appendix Z, "Maximum Work Hour Guidelines."
- b. The methods of implementing a smoking policy are described in MPD 1800.1.

3.3.2.7 Safe work practices instructions include:

- a. Site-wide Safety Rules. These rules represent a minimum set of safety rules for MSFC and MAF, and apply to all personnel on MSFC-owned property. Supervisors shall add safety rules specific to hazardous operations for which they are responsible. See Chapter 3.

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b. Minimum Housekeeping Requirements. These are the minimum housekeeping requirements for all MSFC and MAF areas. Supervisors shall ensure employees are aware of these requirements and any additional specific housekeeping requirements for their area of responsibility. See Chapter 4.

c. Standard Safe Work Practice requirements for electrical operations and jobs are described in MWI 8715.1.

d. Methods to identify and control hazardous conditions are described in MWI 8715.3 and MWI 8715.15.

e. Methods to identify when employees are to wear and use PPE are described in MWI 8715.4. The methods to communicate PPE requirements are described in MWI 8715.3.

f. The methods of implementing a program for facility maintenance are described in NPR 8831.2.

3.3.2.8 Hazard Control Program instructions have been developed to address specific hazard control methods for specific processes, operations and jobs are included in the following directives.

a. The methods of implementing a program for emergency management and responding in the event of an emergency are described in MPD 1040.3 and MPR 1040.3.

b. The methods of implementing an environmental health program are described in MPD 1840.1.

c. The methods of implementing a program for hearing conservation are described in MPD 1840.2.

d. The methods of implementing a program for respiratory protection are described in MPD 1840.3.

e. The methods of implementing a program for radiation safety are described in MPD 1860.2.

f. The methods of implementing a program for environmental management policy are described in MPD 8500.1 and MPR 8500.1.

g. The methods of implementing a program for energy management are described in MPD 8570.1.

h. The methods of implementing a program for security are described in MPR 1600.1.

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- i. The methods of implementing a program for bloodborne pathogens and biohazardous materials are described in MPR 1800.1.
- j. The methods of implementing a program for ergonomics are described in MPR 1800.2.
- k. The methods of implementing a program for sanitation are described in MPR 1800.3
- l. The methods of implementing a program for occupational medicine are described in MPR 1810.1.
- m. The methods of implementing a program for confined space entries are described in MPR 1840.1.
- n. The methods of implementing a program for hazard communication are described in MPR 1840.2.
- o. The methods of implementing a program for the use of hazardous chemicals in laboratories protection are described in MPR 1840.3.
- p. The methods of implementing a program for asbestos use are described in MPR 1840.4.
- q. The methods of implementing a program for radiation safety are described in MPR 1860.1.
- r. The methods of implementing a program for nonionizing radiation are described in MPR 1860.2.
- s. The methods of implementing a program for employee training and certification are described in MPR 3410.1 and MWI 3410.1.
- t. The methods of implementing a program for the material handling, storage, packaging, preservation and delivery are described in MPR 6410.1.
- u. The methods of implementing a program for EMS are described in MPR 8500.2.
- v. The methods of implementing a program of AED use are described in MWI 1810.1.
- w. The methods of implementing a program for packaging, handling and moving hardware identified as program critical are described in MWI 6410.1.
- x. The methods of implementing a program for lifting equipment and operations are described in MWI 6430.1.
- y. The methods of implementing a program for vehicle and motor pool operations are described in MWI 6700.1.

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- z. The methods of implementing a program for green purchasing are described in MWI 8540.2.
- aa. The methods of implementing a program for waste management are described in MWI 8550.1.
- bb. The methods of implementing a program for storm water management are described in MWI 8550.2.
- cc. The methods of implementing a program for wastewater compliance are described in MWI 8550.3.
- dd. The methods of implementing a program for air emissions compliance are described in MWI 8550.4.
- ee. The methods of implementing a program for chemical management are described in MWI 8550.5.
- ff. The methods of implementing a program to investigate and report mishaps and close calls are described in MWI 8621.1.
- gg. The methods of implementing a program for the inspection and certification of PVS are described in MWI 8710.1.
- hh. The methods of implementing a program for electrical safety are described in MWI 8715.1.
- ii. The methods of implementing a program to control hazardous energy (lockout/tagout) are described in MWI 8715.2.
- jj. The methods of implementing a program to identify hazards in the workplace are described in MWI 8715.3
- kk. The methods of implementing a program to identify and select PPE and other safety systems are described in MWI 8715.4.
- ll. The methods of implementing a program to identify employees to perform collateral duty activities in support of a building are described in MWI 8715.5.
- mm. The methods of implementing a program to safely handle and store explosives, propellants and pyrotechnics program are described in MWI 8715.10.
- nn. The methods of implementing a program for fire safety are described in MWI 8715.11.
- oo. The methods of implementing a program to document and track hazards discovered during

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inspections are described in MWI 8715.12.

pp. The methods of implementing a program for employees to report safety concerns are described in MWI 8715.13.

qq. The methods of implementing a program for the safety assessment of ground operations are described in MWI 8715.15.

rr. The methods of implementing a program for the readiness review of hazardous operations are described in MWI 8715.17.

ss. The methods of implementing a program for supervisor SHE visits are described in MWI 8715.16.

NOTE: The Hazard Control Programs listed above are only applicable to MAF to the extent stated in the MPR/MWI Applicability Statement.

3.3.2.9 Managers of facilities/operations identified as hazardous or perceived to contain a high or medium level of risk to employees or property shall establish any additional site or job/task specific controls necessary to ensure personnel, visitor, and property safety.

3.3.2.10 Supervisor shall ensure facilities/operations identified as hazardous and contain high, medium, or low risk to employees are entered into the IHOPS database.

3.3.2.11 Employees shall be encouraged to take a few minutes to think through a potentially-hazardous job before starting. This is especially helpful when performing a non-routine operation or job, and is a good habit that anyone can use for jobs in the workplace or while at home. This is often referred to at MSFC as “Start Safe.” The following questions need to be considered and discussed with everyone involved in the operation or job, so that it can be started and completed safely:

- a. What are the potential hazards that can be associated with this job?
- b. What precautions or actions do I need to take in order to prevent these hazards from causing an accident?
- c. What tools and equipment, including PPE, do I need to do the job safely?
- d. What do I need to do in the event of an accident?

NOTE: This does not negate the need for other safety assessments or pre-job reviews that are identified in MWI 8715.15 and MWI 8715.17.

3.3.2.12 The S&MA manager of Safety and Occupational Health and MSFC Office of Center

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Operations representative located at MAF shall ensure all of the activities and programs contained in the MSFC documents listed in section 3.3.2.8 are implemented at MAF as applicable.

3.3.2.13 The day-to-day performance of the activities contained in the MSFC documents listed in section 3.3.2.8 at MAF are normally conducted by the MSFOC with oversight, direction and assistance from the S&MA manager of Safety and Occupational Health and MSFC Office of Center Operations representative located at MAF.

3.3.2.14 At MAF, the following apply:

- a. The Radiation Program shall comply with the state of Louisiana regulations in addition to those in MPD 1860.2.
- b. The loss of any radioactive material shall be reported immediately to the S&MA manager of Safety and Occupational Health and MSFOC.
- c. Radio frequency/microwave radiation devices shall comply with the state of Louisiana regulations in addition to those in MPR 1860.2.
- d. Hot Work/Flame Permits are issued by the MAF Fire Department.
- e. Excavation/Digging permits are issued by the MSFOC with concurrence from the S&MA manager of Safety and Occupational Health.

3.3.2.15 Buddy System

- a. The buddy system where personnel work in pairs to render emergency assistance shall be used when performing operations identified to contain high or moderate risk of injury to the employee in accordance with the requirements described in MWI 8715.15.
- b. The buddy system or a periodic contact arrangement shall be considered when personnel are required to work alone for 4 hours or longer performing operations analyzed to contain low or minimal risks of injury to employees.

NOTE: When in doubt about when the buddy system is appropriate for use, contact ISB for assistance.

3.3.2.16 Process Safety Management

- a. Activities and operations that include the use of highly-hazardous chemicals shall implement the requirements described in 29 CFR Part 1910.119, as determined applicable. Contact ISB and EEOH for assistance as necessary.

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3.3.3 Occupational Health Care Program.

3.3.3.1 The MSFC and MAF occupational health care programs are intended to prevent, provide diagnosis, treatment, and care of illnesses and injuries caused or aggravated by the work environment and are implemented in accordance with the requirements described in MPR 1810.1.

3.3.3.2 At MSFC, emergency medical services are provided by onsite ambulance service during normal working hours. After normal working hours, the Redstone Arsenal Fire Department serves as the first responders until an offsite ambulance arrives.

3.3.3.3 Offsite emergency medical services are available by calling 911.

3.3.3.4 MSFC and MAF employees are provided cardiopulmonary resuscitation (CPR) training on a voluntary basis.

3.3.3.5 Automated External Defibrillators (AEDs) are also available in some MSFC and MAF buildings. If the building has AEDs, the location is identified on the building's Evacuation/Emergency Plan located in the building's lobby. MSFC and MAF employees are provided AED training on a voluntary basis.

3.3.3.6 At MAF, emergencies, incidents and accidents are reported by calling 911 when using a MAF network phone. When using a cell phone or a non-MAF network phone, call (504) 257-2333 or 911. Emergency medical services are provided onsite and ambulance service is obtained from a nearby hospital.

3.3.3.7 At MAF, the MSFOC provides this staff. Contact the manager of Safety and Occupational Health for assistance if needed.

3.3.4 Facility and Equipment Maintenance.

3.3.4.1 FMO conducts maintenance and repair of facility and infrastructure equipment to prevent it from failing and creating a hazard. FMO maintains the preventive maintenance program to monitor, replace and repair facility and infrastructure equipment at MSFC and MAF.

3.3.4.2 Critical maintenance items shall be identified by the facility and equipment owners and tracked to ensure maintenance schedules are maintained.

3.3.4.3 The facility and equipment maintenance program shall be implemented in accordance with the requirements described in NPR 8831.2.

3.3.4.4 Equipment owners, other than FMO, are responsible for ensuring maintenance and repair of their equipment are conducted to prevent it from failing and creating a hazard.

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3.3.5 Disciplinary System.

3.3.5.1 Employees can be disciplined for violations of the safety and health policies, procedure, and rules. For civil service employees, the disciplinary system requirements are described in DG-03, “NASA Desk Guide for Table of Disciplinary Offences and Penalties.” A current copy of the requirements are maintained for employee awareness on the SHE Web page under the “policies and procedures” pull down menu, select “NASA Disciplinary Program.”

3.3.5.2 Contractor employees; disciplinary systems are described in their respective company policies.

3.3.6 Emergency Preparedness and Response.

3.3.6.1 The MSFC emergency program is implemented in accordance with the requirements described in MPD 1040.3 and MPR 1040.3.

3.3.6.2 MAF’s emergency program is also included in MPD 1040.3. MAF is developing a site-specific MAF Emergency Plan. Contact the manager of Safety and Occupational Health located at MAF for assistance if needed.

3.3.6.3 Fire evacuation drills are conducted in accordance with the requirements described in MWI 8715.11 and NASA STD 8719.11.

3.3.6.4 At MSFC, Emergency/Evacuation plans for specific buildings are posted in common areas on each floor of the respective buildings.

3.3.6.5 Managers of facilities/operations identified as hazardous and/or high risk shall ensure emergency plans are prepared for these facilities/operations and ensure that they are:

- a. Maintained up-to-date.
- b. Provided (a copy) to the MSFC and MAF Emergency Operations Center.
- c. Discussed with the affected personnel.
- d. Exercised periodically during fire and severe weather drills.

3.4 CPR 4 – SHE Training.

3.4.1 SHE Training Program.

3.4.1.1 MSFC’s SHE Program is dependent on employees and supervisors having the basic knowledge and skills necessary to identify and control hazards and the specialized knowledge and skills to perform their jobs in a safe manner.

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a. Safety-related training requirements for employees are identified by the SHE Training Assessment.

b. Safety-related certification requirements for specific processes, operations and jobs are described in MWI 3410.1.

3.4.1.2 S&MA, EEOH, and the Training and Incentives Office shall coordinate the MSFC SHE Training Program. At MAF, the MSFOC coordinates the training for MAF employees.

3.4.1.3 SHE training shall be mandatory for all employees, supervisors, and managers. The type of training courses required is dependent on the employee's assigned duties. See Inside Marshall, select "Center Organizational Web Sites," select "Office of Human Capital – Training & Incentives," select "Mandatory and Required Training."

3.4.1.4 The SHE Training Catalog provides information on all SHE training offered and/or required of MSFC personnel. The catalog is located online on the Safety, Health and Environmental Web page, select the "Training" pull down menu, the "SHE Training." The link to this catalog is located on this page. The online catalog provides a course description, target audience, required frequency, regulatory requirement (if any), and registration link. It also indicates whether the training is mandatory, job dependent, or highly recommended.

3.4.1.5 Supervisors shall ensure operations and jobs conducted by employees are assessed to determine the specific training needed for the employee to conduct the operation or job in a safe and healthful manner.

3.4.1.6 Supervisors shall use the SHE Training Assessment to ensure SHE-related training specific to the process, operation and jobs conducted by their employees is identified and documented for each employee. See MPR 3410.1.

3.4.2 Minimum training for all employees, including managers and supervisors.

3.4.2.1 At a minimum, all employees shall receive training to include the following:

- a. General awareness and the fundamental principles of the SHE Program.
- b. Roles and responsibilities in the SHE Program.
- c. SHE rules applicable to their worksite.
- d. How to recognize and report hazardous conditions in their worksite.
- e. Center and worksite-specific emergency procedures.

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f. How to recognize the signs and symptoms of workplace-related illnesses and how to obtain medical services (e.g., Building 4249, MSFC Medical Center).

g. Specific job/task-related training that identifies the hazards, risks and process of performing a specific job/task in a safe and healthful manner. This can be accomplished by on-the-job training and being familiar with requirements and procedures written specifically for the job/task.

h. When PPE is required for the job/task, the training shall include why PPE is required, the PPE limitations, how to properly use the PPE, how to properly maintain the PPE, and the method to clearly communicate to employees when the PPE is to be worn. See 29 CFR Part 1910.132 and MWI 8715.4.

i. Employees' rights under OSHA 29 CFR 1960.

3.4.3 All employees shall complete any specific SHE-related training identified by their supervisor or designee when completing the SHE Training Assessment, in accordance with the requirements described in MPR 3410.1.

3.4.3.1 If SHE Training Assessment is completed by someone other than the employee's supervisor, they shall be knowledgeable of the employee's operation or job assignments and of what specific training is needed to perform the job/task in a safe and healthful manner.

3.4.4 Employees are designated to support the SHE Program in addition to their everyday duties include those designated as BM and ABM, Organization SHE Point-of-Contact (POC), SHE Committee representatives and Area Managers. These additional duties are referred to as "collateral duties" and require additional training in how to recognize and resolve hazards. Employees assigned to serve in any of these roles shall attend "SHE 103 – SHE Collateral Duty Training" in accordance with 29 CFR Part 1960.58.

3.4.4.1 BM/ABM, organization SHE POC, and SHE Committee representatives shall attend periodic SHE information update meetings conducted by S&MA as necessary. See MWI 8715.12.

3.4.4.2 Responsibilities for employees serving in any of these roles are listed in MWI 8715.5.

3.4.5 All employees that conduct worksite self-inspections shall be trained to recognize workplace hazards, particularly the types of hazards directly related to their work environment in accordance with the requirements described in NPR 8715.1, Chapter 6.

3.4.6 Specialized SHE training requirements that can include assessing the employee's comprehension and training effectiveness for SHE certifications are described in MWI 3410.1.

3.4.7 Sponsors of any visitor whose stay at MSFC or MAF is expected to be over 30 days are to

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ensure the visitor receives, at a minimum, SHE 101V, “SHE Program Awareness Training” within the first 10 days of their visit in accordance with the requirements described in MPR 3410.1, “Training.” This training can be obtained prior to arrival at MSFC or MAF from the MSFC Homepage under “Visitor Information.” Contact ISB for assistance in obtaining this training. At MAF, contact the S&MA manager of Safety and Occupational Health.

3.4.8 Sponsors of any visitor whose stay at MSFC or MAF is expected to be over 60 days shall ensure a SHE Training Assessment is conducted for the visitor to identify the safety-related training needed during their visit.

3.4.9 Sponsors of any visitor whose stay at MSFC or MAF is expected to be over 60 days are to ensure the visitor receives, at a minimum, SHE 101, “SHE Program Awareness Training” within the first 10 days of their visit.” This training can be obtained from SATERN. Contact ISB for assistance in obtaining this training.

3.4.10 Employees whose stay at MSFC or MAF is in support of construction activities are to receive, at a minimum, SHE 101C, “SHE Program Awareness Training for Construction” within the first 10 days of them starting work on the construction project. This training can be obtained prior to arrival at MSFC or MAF from the MSFC Homepage under “Visitor Information.” Contact ISB for assistance in obtaining this training. At MAF, contact the S&MA manager of Safety and Occupational Health.

3.4.11 Employee Training Records shall be maintained in accordance with MPR 3410.1.

3.5 CPR 5 - Environmental Compliance.

3.5.1 MSFC’s environmental management policy, requirements and program are described in MPD 8500.1, MPR 8500.1, and MPR 8500.2.

3.5.2 MSFC’s requirements and procedures for storm water pollution prevention are described in MWI 8550.2 and MWI 8550.3.

3.5.3 MSFC’s clean air requirements and procedures are described in MWI 8550.4.

3.5.4 MSFC’s hazardous waste compliance requirements and procedures are described in MWI 8550.1.

3.5.5 MSFC’s hazardous materials compliance requirements and procedures are described in MWI 8550.5.

3.5.6 MSFC’s energy management requirements and procedures are described in MPD 8570.1.

3.5.7 MSFC’s green purchasing program for purchasing environmentally-preferable products designated by the EPA is addressed in MWI 8540.2.

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3.5.8 MSFC environmental compliance program also includes compliance with the following:

3.5.8.1 40 CFR 1-1068

3.5.8.2 48 CFR Part 1823

3.5.8.3 ADEM Code R.335-6-7

3.5.9 MAF's environmental compliance program is separate from the MSFC environmental compliance program and shall be in compliance with the requirements defined in MPD 8500.1 and the following:

3.5.9.1 Louisiana Administrative Code, Title 33, Environmental Regulations

3.5.9.2 Louisiana Administrative Code, Title 7, Part XXIII, Pesticide Program

3.5.9.3 Louisiana Sanitary Code 48:5, Chapter 73

3.5.9.4 Public Law 7 U.S.C. § 135, "Federal Insecticide, Fungicide, and Rodenticide Act"

3.5.9.5 Public Law 15 U.S.C. (C. 53) 2601-2692, "Toxic Substance Control Act"

3.5.9.6 LDEQ, Title 33 Environmental Regulatory Code

3.5.9.7 Louisiana Department of Health and Hospitals, Drinking Water Distribution Systems and Wastewater Collections Systems Operator Certification Program

3.5.9.8 Louisiana Department of Agriculture and Forestry, Pesticide Laws and Regulations

4. RECORDS

The records listed below are specific to this MPR. Other records associated with the MSFC SHE Program are identified in the applicable Center directives.

4.1 Annual SHE Program Plan shall be maintained by S&MA and destroyed when 10 years old, when superseded, or obsolete, whichever is sooner, in accordance with NPR 1441.1, Agency Filing Scheme (AFS) 1740/1/125/A.

4.1.1 At MAF, the Annual MAF SHE Program Plan shall be maintained by the MSFOC and destroyed when 10 years old, when superseded, or obsolete, whichever is sooner, in accordance with NPR 1441.1, AFS 1740/1/125/A.

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4.2 Inventory of Hazardous/Potentially-Hazardous Operations shall be maintained by S&MA in accordance with NPR 1441.1, AFS 8/108 in the IHOPS database, temporary, destroy/delete when no longer needed.

4.2.1 At MAF, the Inventory of Hazardous/Potentially-Hazardous Operations shall be maintained by the MSFOC in accordance with NPR 1441.1, AFS 8/108 in the IHOPS database, temporary, destroy/delete when no longer needed.

4.3 Monthly SHE Meeting Summary Report shall be maintained by S&MA in accordance with NPR 1441.1, AFS 1150/1/14/B.2, and then destroyed when 3 years old or no longer needed for reference, whichever is sooner.

4.4 OSHA Form 300A, “Summary of Work-Related Injuries and Illnesses,” shall be maintained by S&MA in accordance with 20 CFR Part 1904.33, “Retention and updating” for 5 years following the end of the calendar year that the record covered and then destroyed.

4.4.1 All contractors are responsible for maintaining their own OSHA Form 300A, “Summary of Work-Related Injuries and Illnesses.”

4.5 S&MA Safety Report (the injury, illness, and close call trends) shall be maintained in the SHE Committee minutes in accordance with NPR 1441.1, AFS 1150/1/14/B.2, and then destroyed when 3 years old or no longer needed for reference, whichever is sooner.

4.5.1 At MAF, the MSFOC Safety Report (the injury, illness, and close call trends) shall be maintained in the MAF SHE Committee minutes in accordance with NPR 1441.1, AFS 1150/1/14/B.2, and then destroyed when 3 years old or no longer needed for reference, whichever is sooner.

4.6 Request for Relief (Safety Deviations/Waivers) to MSFC SHE program requirements shall be maintained by S&MA for duration of the deviation/waiver plus 5 years, and then destroyed in accordance with NPR 1441.1, AFS 1410/1/72/E.

4.7 Request for Relief (Safety Deviations/Waivers) to MSFC Program/Project requirements shall be maintained in accordance with the appropriate Program/Project Plan or Configuration Management Plan.

4.8 Safety Program Self-Assessment Report and Safety Trends shall be maintained by S&MA in accordance with NPR 1441.1, AFS 1150 1/14/B.2, and then destroyed when 3 years old or no longer needed for reference, whichever is sooner.

4.8.1 At MAF, Safety Program Self-Assessment Report and Safety Trends shall be maintained by the MSFOC in accordance with NPR 1441.1, AFS 1150 1/14/B.2, and then destroyed when 3 years old or no longer needed for reference, whichever is sooner.

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4.9 SHE Committee Meeting Minutes shall be posted on the Safety, Health and Environmental Web page and maintained in accordance with NPR 1441.1, AFS 1150 1/14/B.2, and then destroyed when 3 years old or no longer needed for reference, whichever is sooner.

4.9.1 At MAF, the MAF SHE Committee Meeting Minutes shall be posted on the MAF Web page and maintained in accordance with NPR 1441.1, AFS 1150/1/14/B.2, and then destroyed when 3 years old or no longer needed for reference, whichever is sooner.

4.10 SCRS records shall be maintained in accordance with MWI 8715.13.

4.11 SHE Inspection records and related Hazard Abatement Plans shall be maintained in accordance with MWI 8715.12.

4.12 SSWP SHE Meeting Minutes shall be maintained by S&MA in accordance with NPR 1441.1, AFS 1150/1/14/B.2, and then destroyed when 3 years old or no longer needed for reference, whichever is sooner.

4.12.1 When SSWP is not utilized, hardcopy records shall be maintained by each supervisor for 3 years and then destroyed.

4.13 Employee Safety Training records shall be maintained in accordance with MPR 3410.1.

4.14 Employee Safety Training records for contractors shall be maintained by the contractor in accordance with MPR 3410.1.

4.15 Record of visitors' safety training when they receive SHE 101V, "SHE Program Awareness Training" shall be forwarded to ISB by the sponsor and maintained by ISB for as long as the visitor is onsite at MSFC and by the MSFOC at MAF in accordance with MPR 3410.1.

4.16 Record of construction employees' safety training when they receive SHE 101C, "SHE Program Awareness Training for Construction" shall be maintained by the contractor in accordance with MPR 3410.1.

5. FLOW DIAGRAM

None.

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CHAPTER 1 SUPERVISOR GENERAL SHE RESPONSIBILITIES

Supervisors shall:

CH1.1 Stop any operation or activity if an unsafe act or condition exists that they feel have the potential to result in loss of life, serious injury/illness to personnel or public, or damage to property or the environment and take appropriate action if an unsafe act or condition exists, report it to management, and ensure subordinates are made aware of their responsibility and authority to do the same.

CH1.2 Promote safety, health, and environmental stewardship by setting a positive example by following the rules, wearing any required personal protective equipment, reporting hazards, reporting injuries and illnesses, and basically doing anything that they expect employees to do and communicating MSFC SHE goals.

CH1.3 Communicate housekeeping rules and look for housekeeping problems as part of their daily routine. See Chapter 4.

CH1.4 Conduct monthly SHE meetings with employees and monthly SHE visits of assigned areas of responsibility. See MWI 8715.16.

CH1.5 Evaluate employees' SHE performance using the performance appraisal system.

CH1.6 Be members of, or support, MSFC's SHE Committees.

CH1.7 Encourage employees to be involved in the MSFC SHE Program. See section 3.1.5 which provides examples of the different methods of how employees can be involved and engaged in the MSFC SHE Program.

CH1.8 Ensure JHAs and other hazard assessments are performed and that employees are aware of the specific hazards associated with the jobs/tasks they are expected to perform. See MWI 8715.15.

CH1.9 Inform employees of the specific hazards associated with their workplace and duties, location of nearest medical treatment facility, procedure for obtaining treatment, method of reporting occupational injuries or illnesses, and their responsibilities and rights under OSHA law. See 29 CFR Part 1960.59 and 29 CFR Part 1903.2(a)(1).

CH1.10 Ensure MSFC Form 596, "Emergency Telephone Numbers," or equivalent is posted on telephones in their area.

CH1.11 Report and investigate mishaps, including close calls. See MWI 8621.1.

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CH1.12 Ensure personnel receive job specific training needed to perform their jobs/tasks in a safe and healthful manner. This includes on-the-job training. See MPR 3410.1.

CH1.13 Ensure personnel are trained and certified where required, before assigning them to perform potentially-hazardous or high risk jobs/tasks that require certification. See MPR 3410.1 and MWI 3410.1.

CH1.14 Ensure all personnel (including visitors, contractors, and researchers) within work areas under their supervision comply with the requirements of the MSFC SHE Program.

CH1.15 Perform a self-assessment of their organization regularly to ensure jobs, tasks and operations performed by the organization are in compliance with the MSFC SHE Program requirements. The self-assessment can be included as part of the monthly supervisor safety visits to the various areas for which the supervisor has responsibility. See MWI 8715.16.

CH1.16 Coordinate, as necessary, with the building’s Access Authority, Protective Services Office, and BMs to identify areas/rooms within their area of responsibility that need to be identified as “access controlled,” “restricted,” “authorized personnel only,” and “Mission Essential Infrastructure (MEI).” See MPR 1600.1.

CH1.17 Ensure, as necessary within their area of responsibility, that access to areas/rooms identified as “access controlled,” “restricted,” “authorized personnel only,” and “MEI” is limited only to employees that have been granted access to those areas/rooms.

CH1.18 Identify a POC that can be contacted to grant access to each area they have identified as “access controlled,” “restricted,” “authorized personnel only,” and “MEI” within their area of responsibility. It is recommended the POC name and phone number be posted adjacent to the posted sign or at the entrance to the controlled area/room.

CH1.19 Ensure jobs/tasks are assessed prior to being performed by employees to identify potential hazards. Any hazards that are identified are eliminated or actions (engineering or administrative) are taken to control the hazards and put in place prior to the job/task being performed. See MWI 8715.15.

CH1.20 Coordinate with technical disciplines to ensure adequate review of program/project SHE-related activities during the planning, construction, testing, and operation phases of new and modified facilities, equipment and processes. See MWI 8715.17.

CH1.21 Ensure the buddy system is used to render emergency assistance when performing operations that have been identified to contain high or moderate risk of injury to the employee. See MWI 8715.15.

CH1.22 Ensure the SHE Training Assessment is completed for each employee for which they are responsible and update this assessment when the employee’s job assignments change that

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can require additional SHE training. See MPR 3410.1.

CH1.22.1 If the SHE Training Assessment is completed by someone other than the supervisor, the employee completing the SHE Training Assessment is to be knowledgeable of the hazards and risks directly associated with the jobs and tasks performed by the employee and technically competent to identify the specific training required.

CH1.23 Ensure employees follow the safety precautions identified by “warning” and “caution” notes in operating procedures. See MWI 8715.15.

CH1.24 Ensure employees wear PPE when required due to the hazards in the area or required by a hazard analysis, operating procedure or PPE signage. See MWI 8715.4.

CH1.25 Ensure all employees within their organization are provided with an equal and high-quality level of SHE protection.

CH1.26 Ensure SHE requirements are considered and integrated into the planning for new equipment, processes and facilities and when there are significant changes to existing equipment, processes and facilities.

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CHAPTER 2 EMPLOYEE GENERAL SHE RESPONSIBILITIES

Employees shall:

CH2.1 Stop any operation or activity if an unsafe act or condition exists that they feel has the potential to result in loss of life, serious injury/illness to personnel or public, or damage to property or the environment, take appropriate action if necessary and report it to the supervisor, the BM, or the safety designee listed on the “Occupational Safety and Health Protection for NASA Employees” poster.

CH2.2 Adhere to the SHE rules, plans, and procedures.

CH2.3 Avoid unsafe acts.

NOTE: EO 12196, “Occupational Safety and Health Programs for Federal Employees” and MSFC management guarantee employees freedom from restraint, interference, coercion, discrimination, or reprisal for exercising their rights in participating in the activities of the Agency’s occupational safety and health programs.

CH2.4 Report all safety, health, and environmental problems, close calls, and mishaps encountered to their supervisor. See MWI 8621.1, MWI 8715.13, and Chapter 5 of this MPR.

CH2.5 Report all fires immediately.

CH2.6 Attend and participate in SHE Committees, SHE meetings, and SHE training and awareness activities.

CH2.7 Correct imminent danger hazards immediately or secure area and mark with hazard warnings to prevent injury or damage. See MWI 8715.3.

CH2.8 Be involved and engaged in the MSFC SHE Program. See section 3.1.5.

CH2.9 Become familiar with emergency procedures and follow them when necessary.

CH2.10 Obtain and post a “Permit for Portable Appliance,” MSFC Form 3798, for privately-owned, electrically-powered appliances with heating elements. See MWI 8715.11.

CH2.11 Be familiar with the safety and health information provided on Material Safety Data Sheets for the hazardous chemicals in their work area. See MPR 1840.3.

CH2.12 Wear PPE when required due to the hazards in the area or required by a hazard analysis, operating procedure or PPE signage. See MWI 8715.4.

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CH2.13 Do not enter areas/rooms identified as “access controlled,” “restricted,” “authorized personnel only,” or “MEI” unless granted access to enter by the areas/rooms POC or supervisor, or organization that identified access to the area/room needed to be controlled.

CH2.14 Assess jobs/tasks prior to performing them to identify any potential hazards. Eliminate the hazards or ensure actions (engineering or administrative) are taken and put in place to control the hazard. See MWI 8715.15.

CH2.15 Receive training specific for the job/task to be performed and certification as required. See MPR 3410.1 and MWI 3410.1.

CH2.16 Use the buddy system so that emergency assistance can be rendered when performing operations identified to contain high or moderate risk of injury to the employee in accordance with the requirements described in MWI 8715.15.

CH2.17 Complete all SHE training identified by their supervisor in the SHE Training Assessment. See MPR 3410.1.

CH2.18 Conduct jobs/tasks following the sequence of steps identified in operating procedures when an operating procedure is required. This includes safety precautions identified by “warning” and “caution” notes. See MWI 8715.15.

CH2.19 Initiate appropriate actions necessary to correct potentially-hazardous conditions that cannot be corrected on the spot. This action includes submitting a facility work request or safety concern, placing cones or barricade pedestals with retractable barricade strap, or erecting a temporary barricade to alert other employees of the hazard. See MWI 8715.3.

CH2.20 Become familiar the specific hazards associated with their workplace and duties, location of nearest medical treatment facility, procedure for obtaining treatment, method of reporting occupational injuries or illnesses, and their responsibilities and rights under OSHA law. See 29 CFR Part 1960.59 and 29 CFR Part 1903.2(a)(1).

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CHAPTER 3 SITE-WIDE SAFETY RULES

All Employees shall:

CH3.1 Move to a secure area immediately after being notified (emergency warning system, fire alarm, or other alarm system).

CH3.2 Remove loose objects or other tripping hazards from floors immediately. Clean liquid spills from floor immediately or highlight by safety cones or signs.

CH3.3 Keep fire exits and means of egress free of boxes, file cabinets, and excess furniture.

CH3.4 Close desk or file drawers when not in use and not open more than one drawer of a file cabinet at a time.

CH3.5 Use only approved ladders, scaffolds, or step stands to reach items stored overhead or out of reach.

CH3.6 When going up or down stairs, take one step at a time and hold the handrail where possible. In situations where there is two-way traffic, bear to the right side of the stairway.

CH3.7 Use proper manual lifting techniques and limit lifts to their personal physical capabilities, (typically no more than 40 pounds per employee).

CH3.7.1 Seek assistance from another employee when the item weighs more than 40 pounds or is too bulky to safely handle.

CH3.7.2 Any task requiring an employee to manually lift an object weighing more than 40 pounds shall be assessed to determine if alternate lifting methods are feasible and only allowed with prior concurrence from the Industrial Safety Branch.

CH3.8 Store hazardous chemicals/materials only in approved cabinets/areas.

CH3.9 Wear seat belts in all vehicles while onsite and anywhere on duty.

CH3.10 Not use cell phone while driving a personal vehicle on MSFC, or anywhere when driving or operating a Government vehicle or equipment except in a hand-free arrangement.

CH3.11 Not leave a vehicle running while unattended.

CH3.12 Walk on sidewalks and/or marked paths, if available.

CH3.13 Not ride bicycles and motorized scooters on sidewalks or inside buildings.

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CH3.13.1 Exception 1: Electric-powered units used by persons with physical disabilities. The ODEO approves the documented “need” for the electric-powered unit and the Industrial Safety Branch approves the electric-powered unit.

CH3.13.2 Exception 2: Bicycles are allowed to be ridden inside MAF building 103.

CH3.14 Wear a suitable helmet conforming to Federal safety standards and a reflective vest when operating or riding bicycles on MSFC roadways in accordance with Redstone Army Regulation 190-5.

CH3.14.1 Exception 1: The use of helmets and reflective vests are not required when riding bicycles from building to building within access controlled areas (i.e., East and West Test Areas, 4700 area complex).

CH3.14.2 Exception 2: Employees riding bicycles on MAF roadways are to comply with the State of Louisiana requirements.

CH3.15 Walk (not run) in buildings, parking lots, or sidewalks. Running is allowed only in designated exercise areas.

CH3.16 Turn off coffeemakers and heat-producing appliances at the end of the shift and when left unattended. See MWI 8715.11.

CH3.17 Avoid cleaning areas/items contaminated with blood or biohazardous materials. (Only personnel who have completed bloodborne pathogens or biohazardous materials training are allowed to clean areas/items contaminated with blood or biohazardous materials.) See MPR 1800.1.

CH3.18 Not feed wild animals.

CH3.19 Except for special “open” events, not bring children into the workplace on a routine basis or for extended visits. When children briefly accompany the parent to the workplace, the employee is responsible for the safety, well being, and conduct of the child.

CH3.20 Not enter any area where a barricade is erected to restrict entry unless authorized to enter. See MWI 8715.3.

CH3.21 Maintain floors, where practical, in a dry condition. Especially important is the prompt cleanup of water, oil drips or grease from vehicular equipment in work areas.

CH3.22 Provide platforms, mats or other dry standing places in areas where wet processes are used.

CH3.23 Keep work areas free from protruding nails, splinters, loose objects, and unnecessary

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holes and openings.

CH3.24 Ensure that sufficient lighting and adequate waste containers are provided in the work area.

CH3.25 Pedestrians have the right-of-way at crosswalk paths that have been designated by a painted crosswalk on the pavement.

CH3.25.1 Vehicles have the right away at main roadway mid-block crossing points with no painted crosswalks. These crossing points are marked with signs stating “Pedestrians Yield to Motorists.”

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CHAPTER 4 MINIMUM AREA ORDERLINESS/HOUSEKEEPING REQUIREMENTS

Employees shall:

CH4.1 Keep area neat and orderly at all times. Limit materials, tools, and equipment out of normal storage places to those needed for operations.

CH4.2 Arrange desks, tables, and other furniture and equipment, so that electrical and telephone cords and outlets do not present a tripping hazard.

CH4.3 Securely fasten shelves, cabinets, lockers, and other furniture to the floor or wall if a possibility of overturning exists.

CH4.4 Store materials so they do not create a hazard. Bags, containers, bundles, and other materials stored in tiers are to be stacked, blocked, interlocked, and limited in height so that they are stable and secure against sliding or collapsing.

CH4.5 Not store items on the top of any free-standing or fixed furniture that is 6 feet or greater in height, unless the top is specifically designed for such purpose.

CH4.6 Stack/arrange items stored on the top of any height furniture so that it does not create a potential hazard to personnel and property.

CH4.7 Not store furniture, equipment, supplies, or other substantial physical objects in required egress corridors and passageways serving six or more people except in lobbies, recessed areas, or other spaces specifically designed for such purpose.

CH4.8 Maintain storage in areas protected by automatic sprinklers at least 18 inches below the level of the sprinkler heads.

CH4.9 Provide waste cans with a self-closing lid and ventilated bottom (UL or ARL approved) in areas that have cloth rags or paper towels saturated with combustible or flammable liquids.

CH4.10 Provide metal cans with self-extinguishing lids in computer rooms and areas that generate a large amount of paper.

CH4.11 Clean work areas and remove combustible materials at the end of each workday.

CH4.12 Not use furnace rooms, boiler rooms, or equipment rooms for storage.

CH4.13 Maintain floors in a dry condition. Clean up any spilled fluids (water, oil, or grease) from floor in the work area.

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CHAPTER 5 HAZARD REPORTING PRECEDENCE

TO REPORT A SUSPECTED UNSAFE CONDITION:

Employees shall be responsible for reporting unsafe or potentially-unsafe conditions in the workplace, or unsafe products the Center produces. Employees are guaranteed freedom from restraint, interference, coercion, discrimination, or reprisal for exercising their rights. Several lines of communication are available. The preferred sequence of reporting safety concerns is:

CH5.1 Contact your supervisor/management.

CH5.2 Contact MSFC Safety Hotline 544-HELP, "Safety Option."

CH5.3 Submit a SHE Report or MSFC SCRS electronically via the SHE Web page or mail-in pamphlet (local bulletin boards).

NOTE: Electronic submission is from "Inside Marshall." Under "Quick Links," select "MSFC Safety Reporting System/WRPPC," then select "SHE Reporting," or from "Inside Marshall," select "Safety, Health and Environment," then "Mishaps, Questions & Concerns," then "Report Mishap/Close Call/Concern."

CH5.4 Contact the Industrial Safety Branch Manager at 544-0046, or at MAF, contact the manager of Safety and Occupational Health at 504-257-2526.

CH5.5 Contact the safety designee listed on the "Occupational Safety and Health Protection for NASA Employees" poster (S&MA Director), NASA Safety Reporting System (NSRS). Forms are available in common areas of buildings at MSFC and on the SHE Web page.

CH5.6 Report safety concerns via OSHA Hotline at 1-800-321-OSHA.

NOTE: If the condition is not satisfactorily corrected, go to the next step. If none of these reporting steps provides satisfactory correction, the employee may file an appeal or grievance. See NPR 8715.1.

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APPENDIX A **ACRONYMS**

ABM	Assistant BM
ADEM	Alabama Department of Environmental Management
AED	Automated External Defibrillator
AFGE	American Federation of Government Employees
AFS	Agency Filing Scheme
AHJ	Authority Having Jurisdiction
AM	Area Manager
ANSI	American National Standards Institute
ARL	Applied Research Laboratory
BM	Building Manager
CD	Center Director
CFR	Code of Federal Regulations
CO	Contracting Officer
CPR	Cardiopulmonary Resuscitation
CPR	Core Program Requirement
CSP	Cooperative and State Program
DASHO	Designated Safety and Health Official
DRD	Data Requirement Document
EEOH	Environmental Engineering and Occupational Health

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EMS Environmental Management System

EO Executive Order

EPCS Employee Performance Communication System

FMO Facilities Management Office

FWR Facilities Work Request

HSPPD Handling, Storage, Packaging, Preservation, and Delivery

HQ Headquarters

IH Industrial Hygiene

IHOPS Inventory of Hazardous Operations

IMSC Integrated Management Systems Council

IRIS Incident Reporting Information System

ISB Industrial Safety Branch

JHA Job Hazard Analysis

JSA Job Safety Analysis

LDEQ Louisiana Department of Environmental Quality

MAF Michoud Assembly Facility

MEI Mission Essential Infrastructure

MESA Marshall Engineers and Scientists Association

MPD Marshall Procedural Directive

MPR Marshall Procedural Requirements

MSAT Marshall Safety and Health Action Team

MSDS Material Safety Data Sheets

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MSFC Marshall Space Flight Center

MSFOC Manufacturing Support and Facility Operations Contractor

MTM Marshall Team Meeting

MWI Marshall Work Instruction

NFPA National Fire Protection Association

NFS NASA FAR Supplement

NRRS NASA Records Retention Schedules

NSRS NASA Safety Reporting System

NSTS NASA Safety Technical Standard

ODEO Office of Diversity and Equal Opportunity

OSHA Occupational Safety and Health Administration

POC Point of Contact

PPE Personal Protective Equipment

PVS Pressure Vessels and Systems

QCP Qualified Credentialed Professional

S&MA Safety and Mission Assurance

SATERN System for Administrative Training and Education Resources for NASA

SCRS Safety Concerns Reporting System

SEB/C Source Evaluation Board/Committee

SHE Safety, Health and Environmental

SHEtrak Safety, Health and Environmental-Finding Tracking System

SSP Space Shuttle Program

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STD Standard

SSWP Supervisor Safety Web Page

TC Trouble Call

UL Underwriters Laboratory

U.S.C. United States Code

VPP Voluntary Protection Program

WCC Work Control Center

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APPENDIX B
MSFC SHE CORE PROGRAM REQUIRMENTS
(Parenthesis indicate section in MPR)

- B.1 CPR 1 - Management Leadership and Employee Involvement. (3.1)
- B.1.1 Management Commitment and Leadership (3.1.1)
- B.1.2 SHE Policy (3.1.1.7)
- B.1.3 SHE Vision (3.1.1.8)
- B.1.4 SHE Goals (3.1.1.9)
- B.1.5 Agreement between MSFC, MESA and AFGE (3.1.1.10 and 3.1.1.11)
- B.1.6 Managers and Supervisors Responsibility and Accountability (3.1.2)
- B.1.7 Employee Accountability (3.1.3)
- B.1.8 Management and Supervisor Involvement (3.1.4)
- B.1.9 Employee Involvement (3.1.5)
- B.1.10 Contractor and Other Non-NASA Personnel Working Onsite Involvement (3.1.6)
- B.1.11 AM/BM Involvement (3.1.7)
- B.1.12 Authority (3.1.8)
- B.1.13 Resources (3.1.9)
- B.1.14 Professional Safety and Health Staff (3.1.10)
- B.1.15 SHE Monthly Meetings (3.1.11)
- B.1.16 Safety Awards (3.1.12)
- B.1.17 SHE Program Evaluation (3.1.13)
- B.1.18 Annual SHE Program Plan (3.1.14)
- B.1.19 Request for Relief from Safety Requirements (3.1.15)

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B.2 CPR 2 - Worksite Analysis. (3.2)

B.2.1 Hazard Assessment (3.2.1)

B.2.2 Routine Self-Inspections (3.2.2)

B.2.3 Unsafe Condition Reporting System for Employees (3.2.3)

B.2.4 IH Program (3.2.4)

B.2.5 Mishap/Close Calls Investigated and Hazards Corrected (3.2.5)

B.2.6 Injury, Illness, and Close Call Trend Analysis (3.2.6)

B.3 CPR 3 - Hazard Prevention and Control. (3.3)

B.3.1 Professional Resources (3.3.1)

B.3.2 Hazard Elimination and Control Methods (3.3.2)

B.3.3 Occupational Health Care Program (3.3.3)

B.3.4 Facility and Equipment Maintenance (3.3.4)

B.3.5 Disciplinary System (3.3.5)

B.3.6 Emergency Preparedness and Response (3.3.6)

B.4 CPR 4 – SHE Training. (3.4)

B.4.1 SHE Training Program (3.4.1)

B.4.2 Minimum Training for all employees (3.4.2)

B.4.3 Specific SHE Training (3.4.3-3.4.6)

B.4.4 Visitor Training (3.4.7-3.4.10)

B.4.5 Training Documentation (3.4.11)

B.5 CPR 5 - Environmental Compliance. (3.5)

B.5.1 MSFC's environmental management policy, requirements and program (3.5.1)

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B.5.2 MSFC's requirements and procedures for storm water pollution prevention (3.5.2)

B.5.3 MSFC's clean air requirements and procedures (3.5.3)

B.5.4 MSFC's hazardous waste compliance requirements and procedures (3.5.4)

B.5.5 MSFC energy management requirements and procedures (3.5.6)

B.5.6 MSFC green purchasing program (3.5.7)

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**APPENDIX C
MSFC SHE PROGRAM REQUIREMENTS COMPARED TO OSHA VOLUNTARY
PROTECTION PROGRAM (VPP) REQUIREMENTS**

CSP 03-01-003 Chapter III sections (4-18-08)	VPP Elements and sub-elements	MPR 8715.1 sections and other MSFC documents that address VPP elements and sub-elements
C.1	Management Leadership and Employee Involvement	3.1.1
C.1.a	Management commitment:	3.1.1.1, 3.1.1.2, 3.1.1.3, 3.1.1.4
	Establish, document and communicate a commitment to provide a safe and healthful work environment with clear goals and objectives that are attainable and measurable.	2.2.4, 3.1.1.4
	Ensure a written S&H management system that documents procedures for implementing S&H elements and sub-elements.	3.1.1.3, 3.1.1.6
	Identify employees and organizations responsible to implement and carry out the S&H goals and objectives and provide adequate authority and resources for them to carry out their responsibilities.	2.2.10, 2.4.7, 2.6., 2.7, 2.8, 2.10, 3.1.8
	Ensure those responsible for implementing and carrying out the S&H are held accountable.	2.3.2, 2.4.2, 3.1.2, 3.1.3
	Ensure a plan is implemented to budget for expenditures for the prompt correction of uncontrolled hazards that result from unusual/emergency.	3.1.9
	Ensure S&H is integrated into the planning for new equipment, process and buildings.	CH 1
	Ensure lines of communication are established with employees that allows them reasonable access to top management.	2.3.17

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	Ensure managers and supervisors set positive example for the S&H management system by basically doing anything they expect the employees to do to comply with the S&H management system requirements.	2.2.2, 2.3.1, 2.4.1, 2.5.1, 2.6.2
	Ensure all employees are provided with equal and a high-quality of S&H protection.	2.2.9, 2.3.18, 2.5.3, 2.6.24, 2.7.7, CH 1
	Ensure an annual evaluation of the MSFC S&H management system is conducted.	3.1.13
	Ensure an agreement is signed with collective bargaining agents.	3.1.1.10, 3.1.1.11
C.1.b	Employee involvement:	3.1.5
	Participate and are involved in the S&H management system in at least 3 meaningful and constructive ways.	3.1.5.2
	Are trained to perform the operations and jobs they are assigned to perform.	3.4.1
	Are provided access to a system that provides them feedback from suggestions, ideas and reports of hazards that they bring to management's attention.	3.2.3, MWI 8715.13
	Obtain orientation for understating of the fundamental principles of the MSFC S&H management system.	3.4.1
C.2	Worksite Analysis	3.2
C.2.a	Perform baseline hazard analysis to identify and document common hazards at the worksite (OSHA regulations, building codes, recognized industry standards).	3.2.1, 3.2.1.6, MWI 8715.15, MWI 8715.12
C.2.b	Perform hazard analysis for routine jobs, tasks and processes.	3.2.1.1, 3.2.1.5
C.2.c	Update hazard analysis when significant changes occur including non-routine tasks, new processes, materials, equipment and facilities.	3.2.1.4

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C.2.d	Review hazard analysis for new equipment, chemicals, facilities, or when a significantly different operation or procedure is to be conducted.	CH 1
C.2.e	Document and use of hazard analysis for a-d.	
C.2.f	Perform self-inspections that cover the entire worksite at least quarterly (weekly for construction) conducted by trained staff with written documentation and hazard correction tracking.	3.2.2, MWI 8715.12, MWI 8715.5, MWI 8715.16
C.2.g	Implement a hazard reporting system for employee to express concerns and receive a timely response.	3.2.3, MWI 8715,13
C.2.h	Implement an Industrial Hygiene program that samples, tests and analyses follow nationally-recognized procedures.	MPD 1810.1
C.2.i	Accidents and Near-Misses are investigated by trained employees and reports are generated to identify findings and all contributing factors.	3.2.5. MWI 8621.1
C.2.j	Trend analyses are developed for injury, illness and related data used to identify common causes and needed corrections in procedures, equipment or programs.	3.2.6, SHE Web page under "Metrics and Status" pull down menu select "current safety metric," or "safety search."
C.3	Hazard Prevention and Control	3.3
C.3.a	Provide access to certified professional resources.	3.1.10, 3.3.1
C.3.b	Implement a hazard elimination and control method to identify, document and eliminate or control hazards and is communicated to employees.	3.3.2, MWI 8715.12, MWI 8715.3
C.3.c	Document and implement the hazard control programs required by OSHA.	3.3.2.6
C.3.d	Implement an Occupational Health Care Program (medical services, staff trained in CPR and hazard analysis by licensed health care professionals).	3.3.3, MPR 1810.1

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C.3.e	Implement a preventive/predictive maintenance system that reduces safety-critical equipment failures and schedules routine maintenance and monitoring.	3.3.4, NPR 8831.1
C.3.f	Implement a system to track of hazard correction.	MWI 8715.12, MWI 8715.13
C.3.g	Implement a disciplinary system that operates for all employees who disregard rules.	3.3.5, SHE Web page under the “policies and procedures” pull down menu select “NASA Disciplinary Program.”
C.3.h	Implement an emergency preparedness and response program to cover emergency situations including emergency and evacuation drills for all shifts.	3.3.6, MPR 1040.3, MWI 8715.11
C.4	Safety and Health Training	
C.4.a	Provide training for managers, supervisors and non-supervisory employees on the S&H management system, hazards and the hazard controls that are in place.	3.4.2, MPR 34101.
C.4.b	Provide training as required by OSHA for activities covered by a particular OSHA standard.	3.4.1, SHE Webpage (SHE Training Catalog)
C.4.c	Provide training to managers and supervisors so they understand their S&H responsibilities.	3.4.1, SHE 106, SHE 117, SHE 118
C.4.d	Provide orientation training to all employees to recognize hazards in the workplace, protective measures, emergency evacuation, employee rights under the OSH Act and the MSFC SHE Program.	3.4.2, SHE 101, SHE 102, SHE 103
C.4.e	Provide training for all employees regarding their responsibilities in each type of an emergency.	3.4.1, SHE 101, SHE 108
C.4.f	Provide training for employees conducting hazard analysis, inspections, and accident and near-miss investigations.	2.6.28, 2.7.9

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C.4.g5	Document all S&H training provided.	3.4.6, MPR 3410.1, SATERN
C.4.h	Ensure training curricula is up-to-date and understandable for all employees.	2.6.26, 2.7.8
C.4.i	Ensure training is provided by employees knowledgeable in the subject matter.	2.6.26, 2.7.8
C.4.j	Provide training for employees required to wear PPE.	3.4.2, MWI 8715.4

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APPENDIX D MAXIMUM WORK HOUR GUIDELINES

D.1 Supervisors are recommended to use the following guidelines for workers whose job performance can directly impact the safety of others, the safety of NASA high value property, or mission safety, and to consider them for other workers.

D.2 Maximum Work Periods:

D.2.1 12 Consecutive hours (16 hours in an emergency situation).

D.2.2 60 hours during a workweek (7-day period).

D.2.3 7 consecutive days without at least 1 full day off.

D.2.4 240 hours during a 4-week period.

D.2.5 2,500 hours during a rolling 12-month period.

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APPENDIX E **REFERENCES**

E.1 MSFC 52.223-94, “Safety Performance Evaluation, Evaluation Criteria and Performance Recognition”

E.2 CSP 03-01-003, “Voluntary Protection Programs (VPP): Policies and Procedures Manual.