KENNEDY SPACE CENTER

TROPICAL STORM AND HURRICANE OPERATIONS

[redacted]

Director

John F Kennedy Space Center
National Aeronautics and Space Administration

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CHANGE LOG

DATE	Description	REVISION
06/25/2020	• Emergency Coordinators (ECs) were changed to Hurricane Coordinators (HCs) throughout • 4.1.5 - The website "kscsos.com" was added to the list of sources for information regarding the Center's status • Institutional Services Contract (ISC) was changed to Base Operations & Spaceport Services (BOSS) throughout • 4.4, Initial Assessment, and Appendix F, Recovery Phase - new text added to make it clear that facilities on KEMCON's list of "prioritized facilities with potential environmental hazards" should only be entered initially by KEMCON Industrial Hygiene (IH) personnel, or in a team that includes IH personnel. • Appendix B - action updated, noting the HURCON IV action for KEMCON to validate/update list of prioritized facilities with potential environmental hazards, and send to KSC EOC • Appendix E - action updated to include the EOC's HURCON I action of advising Security, Fire, BOSS ROT Chief, and DART Chief that facilities on KEMCON's prioritized facilities list should not be entered prior to IH assessment • Appendix C - actions updated to indicate scheduling, announcing, and conducting the Ride-Out Team Briefing as an EOC action item during HURCON III • ISC Duty Office was changed to Spaceport Integration Center throughout • Information Management and Communications Support (IMCS) was changed to Kennedy Infrastructure, Applications and Communications (KIAC) throughout • Appendix G - corrected to indicate that Ride-Out Team assembly, briefing, and release generally occurs during HURCON III • Appendix G - Ride-Out Team Personnel Numbers table was edited to reflect current ROT staffing numbers per organization • Appendix H - updated to reflect current ROT staffing and sheltering locations, as well as to indicate that ROT personnel are expected to bring their own food (and bottled water, if desired)	Rev E-2

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DATE	Description	REVISION
	• Appendix J, Generator Plan - amended to include permanently installed generator at the new Central Campus Headquarters Building • Appendix K, Generator Request form - amended to omit instructions to submit the form via fax • Appendix M - "Weather Safe" definition amended to provide a suggested wind speed threshold to guide the NEMO in making the "Weather Safe" declaration, at their discretion	
07/18/2023	• Document title from Tropical Storm and Hurricane Preparation to Tropical Storm and Hurricane Operations • Cape Canaveral Air Force Station (CCAFS) to Cape Canaveral Space Force Station (CCSFS) throughout • 45th Space Wing to Space Launch Delta 45 throughout • 3.2 (c) – Remove mention of KDP-KSC-P 3005 • 3.3 (e) – Removed reference to United States Air Force 45th Weather Squadron • 3.4- Added KSC Weather Officer information • 3.5- Changed reference to Kennedy Protective Services Contract (KPSC) to NASA Protective Services Contract- Southeast Region (NPSC-SR) • 3.7 - Emergency Support Function was removed • 3.10- Added in information for Human Resources, Procurement and Chief Counsel's roles and responsibilities • 4.0- Shortened the introduction and removed the listed bullets for the order of precedence • 4.1.1(c)- Removed • 4.1.2- Added regarding Tropical Cyclones threats • Sections 4.1.4 and 4.1.5- Removed • 4.2.1 (f)- Added information regarding KSC personnel responsibilities • 4.2.2 (a) and (c) have switched • 4.2.4- Added ROT, Security Police and Fire personnel guidelines • 4.4- Added sections 4.4.1- 4.4.3 • 4.5- Added DART operations info, removed recovery section • Appendix B- Additional actions have been added • Appendix C and D- Actions have been updated	

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DATE	Description	REVISION
	• Appendix E- Updated actions as well as added information to the introduction • Appendix G- Changed Appendix name and added in additional information • Appendix H- Added additional information • Appendix L- Added section regarding kiosk vehicles • Changed KIAC to AEGIS throughout	

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1.0 PURPOSE

This National Aeronautics and Space Administration (NASA), Kennedy Space Center (KSC), Kennedy Documented Procedure (KDP)-KSC-P-3006 establishes uniform requirements, identifies roles and responsibilities, and describes essential actions necessary for the effective preparation for, response to, and initial recovery from tropical storms and hurricanes.

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2.0 APPLICABILITY

This KDP applies to all KSC civil servants, KSC contractor organizations, and tenants operating within the boundaries of KSC and in NASA facilities on Cape Canaveral Space Force Station (CCSFS). Implementation of this KDP commences when a Hurricane Condition (HURCON) is declared, or tropical storm preparations are deemed necessary. Each organization operating at KSC and CCSFS shall develop ancillary procedures to be implemented as HURCONs are declared. Refer to the attached Appendixes for specific HURCON action checklists. Other applicable documents include NASA Policy Directive 8710.1, Emergency Management Program Policy, and Kennedy NASA Procedural Requirements 8715.2, Comprehensive Emergency Management Plan.

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3.0 ROLES AND RESPONSIBILITIES

This section defines the roles and responsibilities of KSC personnel for the effective implementation of this KDP. Specific functional tasks and actions required by this KDP are described in Section 4, Execution of Storm Preparations and Response, and attached appendixes.

3.1 Center Director

The Center Director or designee has the ultimate responsibility for the safety and security of KSC and has the authority to deviate from this KDP as situations warrant. The Center Director or designee shall serve as chair of the Emergency Decision Team (EDT). When a HURCON is declared, the Center Director or designee will coordinate the declaration with the Space Launch Delta (SLD) 45 Commander or designee.

3.2 Emergency Decision Team

a. The EDT membership shall include the Center Director, KSC senior management, and representation from KSC contractor, partner, and tenant senior management.

b. The KSC EDT shall convene when a tropical storm, hurricane, or other significant emergency threatens KSC.

c. The KSC EDT shall determine when this KDP is activated. For tropical storms, the EDT may declare a modified HURCON, based on the weather forecast and risk probabilities.

3.3 NASA Emergency Management Officer (NEMO)

The NEMO shall:

a. Develop and maintain all NASA KSC emergency preparedness documentation and procedures.

b. Determine the adequacy of KSC contractors' and tenants' emergency preparedness plans.

c. Recommend assembly of the EDT upon imminent threat to KSC.

d. Activate and lead the Emergency Operations Center (EOC) and issue pertinent announcements and notifications to the KSC workforce.

e. Maintain frequent communication with the KSC Weather Officer and/or CCSFS 45th Weather Squadron, and facilitate the necessary weather reports to the EDT for decision making and to other KSC organizations for situational awareness.

f. Upon a HURCON declaration by the Center Director, notify the SLD 45 Crisis Action Team and CCSFS Emergency Management of the HURCON as soon as possible.

g. Serve as the Incident Commander (IC) for storm preparations and response at KSC through storm ride-out operations, including the initial damage assessment upon determining "Weather Safe" condition.

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h. Coordinate with the Damage Assessment and Recovery Team (DART) Chief regarding potential activation of DART.

i. Transfer command to the DART Chief when applicable.

3.4 KSC Weather Officer

a. The KSC Weather Officer shall ensure embedded 45th Weather Squadron support in the KSC EOC for ride out.

b. Coordinate with the NEMO regarding forecast and recommendations in advance of EDT meetings.

3.5 Emergency Operations Center

The EOC serves as the focal point for hurricane preparation and response. The NASA Protective Services Contract – Southeast Region (NPSC-SR) emergency managers operate the EOC.

3.6 Ride-Out Team

The Ride-Out Team (ROT) shall reside at KSC for the duration of the storm. The purpose of the ROT is to keep essential infrastructure operational and perform initial damage assessment. The operational intent is to have all ROT members sheltered prior to the onset of sustained 35 knot (kt) winds. Refer to Appendix G, *ROT Staffing, Sheltering, and Accountability*, for ROT membership and ride-out locations.

3.7 Damage Assessment and Recovery Team

Refer to KDP-KSC-P-3007, Damage Assessment and Recovery.

3.8 Hurricane Coordinator

The Hurricane Coordinator (HC) shall:

a. Serve as directorate or organization liaison to the NEMO and EOC for storm preparation activities.

b. Assist in disseminating information to respective organizations for hurricane preparation, response, and recovery.

c. Develop and maintain complete understanding of this KDP, including all appendixes.

3.9 KSC Directors and Heads of KSC Contractor and Tenant Organizations

KSC Government, contractor, and tenant senior managers shall:

a. Develop and maintain organizational emergency preparedness plans in accordance with this KDP.

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b. Identify a primary and alternate HC for the respective directorate or organization. Ensure that these individuals obtain and maintain the appropriate training and experience to fulfill this role. Consult the NEMO for assistance, if necessary.

c. Identify ROT members and submit these names, contact numbers and ride-out locations to the EOC during HURCON III. Any subsequent changes must be submitted to the EOC as soon as possible.

d. Support the DART Chief annual meeting in accordance with KDP-KSC-P-3007, Damage Assessment and Recovery, identify DART members prior to the start of hurricane season (June 1), and submit these names and roles to the DART Chief in order to prioritize emergency support function duties.

3.10 Human Resource (BA) Director, Procurement Office (OP) Director and General Counsel (CC)

In advance of hurricane season, Human Resources and Procurement Office shall develop General Counsel-reviewed template correspondence to facilitate the release of civil servants and contractors, respectively, from on-center duty.

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4.0 EXECUTION OF STORM PREPARATIONS AND RESPONSE

Since safety is paramount at KSC, all personnel shall prioritize and take appropriate HURCON actions upon a HURCON declaration.

4.1 Preparation

4.1.1 Upon direction from the NEMO, the EOC shall:

a. Ensure the entire KSC workforce is notified via the Paging and Area Warning System (PAWS) and Center-wide email upon HURCON status change.

b. Utilize WebEOC as the primary method for HCs to report HURCON status to the EOC. Alternate methods include e-mail and phones, if necessary.

4.1.2 Whenever a tropical cyclone poses a potential threat to KSC, a meeting of the EDT will be convened.

a. NEMO and KSC Weather Officer will collaborate in advance of the EDT meeting.

b. NEMO shall facilitate the EDT meeting and the KSC Weather Officer will brief the EDT for situational awareness and decision-making. KSC hurricane preparations must begin 72 hours in advance of the storm, HURCON IV, or as determined otherwise by the EDT.

4.1.3 The following table contains the HURCONs that are used by KSC to communicate to the workforce the forecasted time of sustained winds at 50 kt or 58 miles per hour (mph) or greater:

KSC Hurricane Conditions

HURCON	FORECAST
HURCON IV	>50 kt/58 mph winds within 72 hours
HURCON III	>50 kt/58 mph winds within 48 hours
HURCON II	>50 kt/58 mph winds within 24 hours
HURCON I	>50 kt/58 mph winds within 12 hours

4.1.4 The NEMO and EDT shall use the Saffir-Simpson Scale (see table below) to specify hurricane categories, intensity, and potential damages:

STORM TYPE	FORECASTED WINDS	POTENTIAL DAMAGE
Category 1	74 mph–95 mph	Minimal
Category 2	96 mph–110 mph	Extreme
Category 3	111 mph–129 mph	Devastating
Category 4	130 mph–156 mph	Catastrophic
Category 5	157 mph or greater	Catastrophic

4.1.5 Base Operations and Spaceport Services (BOSS) Logistics contract personnel shall prepare ride-out shelter kits for the ROT, consisting of cots, blankets, flashlights, and batteries. BOSS personnel shall deliver these items to the EOC in the Launch Control Center (LCC), Building K6-0900, second floor, Room 2R21; Fire Station #2, J6-2370

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(modified kit with cots only); and Security Patrol Headquarters (K6-2496) in advance of hurricane ride-out.

4.2 KSC Response

4.2.1 HURCON IV: Upon the declaration of HURCON IV, all organizations shall begin the initial notification and preparation phase, which includes the following primary actions:

a. Implement organization-specific checklists.

b. Supervisors prepare to implement 24-hour work schedules, if directed.

c. Begin identifying ROT members and be prepared to submit these names, contact numbers and ride-out locations to the EOC at HURCON III. Any subsequent changes must be submitted to the EOC as soon as possible.

d. Ensure all Government-Owned Vehicles (GOV) and General Services Administration (GSA) vehicles are fully fueled.

e. Prepare and safely stage recovery vehicles and equipment.

f. It is responsibility of all KSC Spaceport personnel to check available information resources for Center status.

g. See Appendix B for HURCON IV Actions Checklist.

4.2.2 HURCON III is the phase when most preparations occur. This phase includes the following primary actions:

a. Implement organization-specific checklists.

b. Brief non-ROT personnel of Center status information sources. It is responsibility of all KSC Spaceport personnel to check available information resources for Center status.

c. Ensure all GOV and GSA vehicles are fully fueled and parked in designated locations.

d. Secure facilities, property, and equipment. Refer to Appendix I for a list of critical facilities authorized to receive shutters.

e. ROT personnel, with supervisor permission, should be excused to return to their homes to attend to personal needs prior to the storm. ROT personnel shall then return to the Center to ride out the storm in facilities/shelters identified in Appendix G, *ROT Staffing, Sheltering, and Accountability*.

f. Report any equipment, vehicle, or manpower shortages to the EOC as soon as possible.

g. See Appendix C for HURCON III Actions Checklist.

4.2.3 HURCON II is the phase when all securing actions shall be completed or terminated. KSC organizations shall initiate the actions for HURCON II: See Appendix D for HURCON II Actions Checklist.

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4.2.4 HURCON I is 12 hours prior to the forecasted arrival of sustained 50 kt (58 mph) surface winds. Prior to the expected onset of sustained 35 kt (40mph) surface winds (measured at 54 feet (ft) or below), ROT members should be sheltered at their designated locations. With Center Director concurrence at a previously held EDT meeting, the Security Police Support Operations Commander (or designee), at his discretion, may use 35 kt sustained surface winds as a guideline when determining when to direct Security Police officers to suspend patrols, close any gates that are still open, and shelter in their designated ride-out facility. Similarly, the Fire Services Shift Officer may, at his discretion, utilize 35 kt sustained surface winds as a guideline when determining when to suspend fire services. Security Police and Fire Services shall notify the EOC once determinations are made. See Appendix E for HURCON I Actions Checklist.

4.3 Storm Ride-Out

Unless otherwise directed by the NEMO, for Tropical Storm through Category 2 storms, ROT personnel shall shelter in their previously identified ride-out locations. For Category 3, 4, and 5 storms, all ROT personnel shall shelter in the LCC, Building K6-0900. Refer to Appendix G, *ROT Staffing, Sheltering, and Accountability*, and Appendix H, *Ride-Out Supply and Provisions* for additional direction and instruction.

4.4 Initial Assessment

4.4.1 Prior to “Weather Safe” declaration, NEMO will meet with ROT initial assessment element leads on windshield surveys, damage reporting, and other pertinent information.

4.4.2 After the storm has passed, the NEMO shall determine when it is safe to perform the initial damage assessment, which will be initiated by the NEMO’s “Weather Safe” (See Appendix M) declaration. This term is used to denote that the storm winds have subsided to a safe level so that ROT members can go outside their sheltered locations to assess damages.

4.4.3 Environmental and Medical Contract (NEMCON) personnel maintain a list of “prioritized facilities with potential environmental hazards,” and these facilities should only be entered initially by NEMCON Industrial Hygiene (IH) personnel, or in a team that includes IH personnel. Coordination with the DART Team Chief may be necessary to ensure that none of these facilities are entered by DART personnel prior to IH assessment.

4.4.4 Based on the ROT initial assessment, KSC bridges may need to be inspected before personnel traverse these structures. Haulover Canal Bridge should be the first bridge to be inspected.

4.5 DART

4.5.1 After the ride-out phase, if a DART activation is required, the NEMO will transfer Incident Command to the DART Chief. The EOC will no longer be staffed on-site, but will remain in “activated” status, as the NEMO and emergency management personnel continue to monitor and support the incident until the “All Clear” declaration.

4.5.2 DART operations shall be performed in accordance with KDP-KSC-P-3007, Damage Assessment and Recovery.

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4.5.3 At this time, DART members, as well as assessment and recovery personnel for commercial customers, tenants, and partners (including the Visitor Complex) may return to the Center to begin recovery and restoration of their respective areas of responsibilities. To verify the Center status, call 321-861-7900 or 866-572-4877, or visit the KSC Operating Status website.

4.6 Reopening KSC for Normal Business

4.6.1 The EDT, with advice from the NEMO and the DART Chief, shall determine when recovery efforts result in the ability to safely reopen some or all of KSC for normal business; “All Clear” will be declared for KSC.

4.6.2 All Government and contractor personnel who work at KSC shall call the Center status information lines for up-to-date status information: 321-861-7900 or 1-866-572-4877, or visit the KSC Operating Status website.

4.6.3 Center Engagement and Business Integration Services Directorate (PX) shall maintain the KSC Operating Status website and communication with the media.

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APPENDIX A: GENERAL PREPARATORY ACTIONS CHECKLIST

All KSC on-site organizations shall exercise prudent precautions and undertake preparations necessary to protect life and property, including Government and commercial assets, at KSC. The following actions are general in nature. They should be completed by the beginning of hurricane season on June 1 of each year and must be verified by each organization prior to declaration of HURCON IV for each specific storm.

ACTION

a. Ensure primary and alternate HCs attend the Emergency Management Office's annual HC training.

b. Develop and review detailed checklists or implementing instructions, as necessary, to ensure protection of personnel, materials, systems, temporary structures, trailers, facilities, and equipment.

c. Update facility manager notification procedures, names, and telephone numbers.

d. Police all outside areas for loose material and secure the materials inside or in place (signs, markers, steps, platforms, free-standing ashtrays, etc.).

e. Inventory ride-out shelter kits, supplies, etc., and procure, through supply channels, materials to replenish kits as needed to secure and prepare facilities.

f. Check trailer and portable building tie-downs (refer to KSC-PLN-1904, Trailer/Equipment Tie-down Plan for the John F. Kennedy Space Center). During hurricane season, trailers and portable buildings expected to remain stationary for more than 72 hours must be equipped with tie-downs.

g. Update recall rosters for all personnel notifications.

h. Ensure equipment, personnel, and materials are available to accomplish preparation actions.

i. Establish procedures to protect classified materials.

j. Report problems and discrepancies that cannot be corrected or resolved to Emergency Management via email to ksc-eoc@mail.nasa.gov.

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APPENDIX B: **HURRICANE CONDITION IV ACTIONS CHECKLIST**

HURCON IV is the initial notification and preparation phase. Upon declaration of HURCON IV, organizations at KSC shall implement their unit-specific checklists, and all organizations shall be prepared to implement 24-hour work schedules, if directed. The following actions shall be accomplished by the respective organization (ORG) or Point of Contact (POC) upon declaration of HURCON IV:

	ACTION	**ORG/POC**
a.	Activate the EOC.	NEMO
b.	Notify NASA Headquarters Office of Protective Services of KSC status.	NEMO
c.	Keep Center Director informed on matters concerning readiness; make recommendations, as required	NEMO
d.	Create an incident in WebEOC, log events, and notify HCs to update status.	EOC
e.	Ensure HURCON Center-wide announcements are made via PAWS and email.	EOC
f.	Update recorded telephone message on both lines.	EOC
g.	Ensure satellite phones are fully charged and operational.	EOC
h.	Contact KSC Mobil service/gas station to verify current fuel supplies, and to confirm that they have coordinated with the supplier to ensure adequate quantities, if required.	EOC
i.	Communicate with Brevard County EOC and SLD 45 regarding hurricane actions.	EOC
j.	Solicit ROT personnel rosters	EOC
k.	Update Center Status website.	PX
l.	Update Center electronic signs at gates.	PSCC
m.	Begin hurricane preparations in all organizational areas.	ALL
n.	Inventory and replenish any low essential supplies.	HCs
o.	Report supply shortfalls, unusual requests, and major problems to the EOC, at 321-867-9200 or by e-mail to ksc-eoc@mail.nasa.gov.	HCs
p.	Identify ROT members and submit these names, contact numbers and ride-out locations to the EOC.	Directors/Program Managers

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	ACTION	ORG/POC
q.	Identify embedded 45th Weather Squadron support in the KSC EOC for ride out.	KSC Weather Officer
r.	Refine General Counsel-reviewed template letters to facilitate the release of civil servants and contractors, respectively, from on-center duty.	BA/OP
s.	Fully fuel all GOV and GSA vehicles.	ALL
t.	Provide hurricane notification to, and coordinate information with, construction contractors.	BOSS/COMET/ EGS/NE/SI
u.	Notify appropriate HC of problems encountered while securing facilities.	Facility Mgrs.
v.	Validate/update list of prioritized facilities with potential environmental hazards, and send to KSC EOC	NEMCON
w.	Request that the vendor for the LCC “Micro Market” in 1R14/1R21 fully stock in advance of a hurricane ride-out	EOC
x.	Notify EOC after all HURCON IV actions are completed.	HCs
y.	Review HURCON III actions in anticipation of possible declaration.	ALL

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APPENDIX C**: HURRICANE CONDITION III ACTIONS CHECKLIST**

HURCON III is the second preparation phase. The following actions shall be accomplished by the respective organization or point of contact upon declaration of HURCON III:

	ACTION	**ORG/POC**
a.	Log all actions.	EOC
b.	Notify HCs of HURCON III and provide ROT information.	EOC
c.	Ensure HURCON Center-wide announcement is made via PAWS and email.	EOC
d.	Update recorded telephone message on both lines.	EOC
e.	Update Center Status website.	PX
f.	Update Center electronic signs at gates.	PSCC
g.	Ensure all HURCON IV actions are complete.	All
h.	Cover electronic equipment with plastic and elevate if possible.	All
i.	Secure classified material and equipment.	All
j.	Move critical spares and equipment to approved locations.	Users
k.	Lower crane booms and secure.	Users
l.	Take home all personal food items in all office refrigerators.	All
m.	Park all GOV and GSA vehicles according to the Vehicle Parking Plan (Appendix L)	All
n.	Prepare DART equipment for relocation.	DART Chief
o.	Prepare post-hurricane recovery materials and equipment.	DART Chief
p.	Brief non-ROT personnel on Center status information sources.	HCs
q.	Deliver shutters to predetermined staging locations.	BOSS
r.	Provide electrical generator power to facilities with sump pumps.	BOSS
s.	Provide hurricane notification to, and coordinate information with, construction contractors.	BOSS/COMET/ EGS/NE/SI
t.	Ensure construction contractors protect partially complete structures and secure all loose items and equipment.	BOSS/COMET/ EGS/NE/SI

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	ACTION	ORG/POC
u.	Place crews on standby to operate vehicles and heavy equipment.	BOSS
v.	Coordinate bridge securing with Coast Guard.	BOSS
w.	Recall required personnel, as necessary, for storm preparation or place on standby.	Mgrs./Supvs.
x.	Provide escorts for heavy equipment, as needed.	NPSC-SR
y.	Communicate with Brevard County EOC and SLD 45 regarding hurricane actions.	EOC
z.	Make decision to stop all KSC tours.	EDT/Delaware North
aa.	Ensure Ride-Out shelter kits are ready for distribution; coordinate with EOC to confirm numbers of kits required at Fire Station #2 and Security Patrol HQ.	BOSS
bb.	Provide the EOC with numbers of personnel scheduled to remain as part of the ROT, as well as shelter location(s), POCs, radio nets, call signs, and telephone numbers.	Directors/Program Managers
cc.	Provide to EOC the names and contact information for 45th Weather Squadron personnel scheduled to staff the KSC EOC during ride-out.	KSC Weather Officer
dd.	Discuss Computer Data Center shutdown procedures.	NEMO/IT
ee.	Make decision to take down antennas and instruments or protect in place.	Users
ff.	Ensure all outside hazardous materials and designated storage sites are secure.	Users
gg.	Secure chemical toilets and ensure potable water tanks are operational.	BOSS
hh.	Install all generators at designated facilities.	BOSS
ii.	Remove and secure all portable signs.	BOSS
jj.	Close airfield to all incoming aircraft except hurricane reconnaissance and emergency aircraft.	Space Florida
kk.	Install shutters at designated facilities.	BOSS
ll.	Evacuate aircraft and helicopters, or secure in place.	Flight Ops
mm.	Clear Shuttle Landing Facility ramps, runways, and taxiways.	Space Florida

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	ACTION	ORG/POC
nn.	Secure cargo and close all aircraft (if aircraft cannot depart).	Space Florida
oo.	Provide portable generators as required by the EOC.	BOSS
pp.	Secure all facility systems according to internal plans.	AEGIS
qq.	Update Center Status website.	PX
rr.	Keep Center Director informed on matters concerning readiness; make recommendations, as required.	NEMO
ss.	Notify NASA Headquarters Office of Protective Services of KSC status.	NEMO
tt.	Notify appropriate HCs of problems encountered while securing facilities.	Facility Mgrs.
uu.	Notify EOC after all HURCON III actions are completed.	HCs
vv.	Review HURCON II actions in anticipation of possible declaration.	HCs

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APPENDIX D**: HURRICANE CONDITION II ACTIONS CHECKLIST**

HURCON II is the phase when most preparation activities shall be completed, and evacuation of nonessential personnel *may* be directed. The following actions shall be accomplished by the POC upon declaration of HURCON II:

	ACTION	**ORG/POC**
a.	Log all actions.	EOC
b.	Ensure HURCON Center-wide announcement is made via PAWS and email.	EOC
c.	Update recorded telephone message on both lines.	EOC
d.	Update Center Status website.	PX
e.	Update Center electronic signs at gates.	PSCC
f.	Ensure all HURCON III actions are complete.	All
g.	Communicate with Brevard County EOC and SLD 45 regarding hurricane actions.	EOC
h.	Ensure hurricane shelter kits have been issued or delivered, and provide a means for opening the kits (breaking the metal band seal), upon request	BOSS
i.	Keep Center Director informed on matters concerning readiness; make recommendations as required.	NEMO
j.	Keep NASA Headquarters Office of Protective Services informed on KSC status.	NEMO
k.	Upon request from Advanced Enterprise Global Information Technology Solutions (AEGIS) Communications Control, secure the Vehicle Assembly Building (VAB) Repeater EOC/Security and Banana River Repeater site gates (321-861-6677 or 321-861-2121).	IT
l.	Notify appropriate HC of any problems securing facilities.	Facility Mgrs.
m.	Ensure immediate access to LCC for ROT.	EOC
n.	Make decision to secure computer data as necessary.	IT
o.	All dumpsters shall be latched and moved to parking lots at K6-0848, M6-0486, and M7-0355.	BOSS
p.	Maintain accountability of all personnel.	Mgrs./Supvs

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q.	Notify EOC when all HURCON II items are complete.	HCs
r.	Review HURCON I actions in anticipation of possible declaration.	HCs

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APPENDIX E: **HURRICANE CONDITION I ACTIONS CHECKLIST**

HURCON I is the phase when all securing actions shall be completed or terminated. Prior to the expected onset of sustained 35 kt (40mph) surface winds (measured at 54 ft or below), ROT members should be sheltered at their designated locations. With Center Director concurrence at a previously held EDT meeting, the Security Police Support Operations Commander (or designee), at his discretion, may use 35 kt sustained surface winds as a guideline when determining when to direct Security Police officers to close any gates that are still open, and shelter in their designated ride-out facility. Similarly, the Fire Services Shift Officer may, at his discretion, utilize 35 kt sustained surface winds as a guideline when determining when to suspend fire services. Security Police and Fire Services shall notify the EOC once determinations are made.

	ACTION	**ORG/POC**
a.	Log all actions.	EOC
b.	Ensure all HURCON II actions are complete.	All
c.	Ensure HURCON Center-wide announcement is made via PAWS and email.	EOC
d.	Update recorded telephone message on both lines.	EOC
e.	Update Center Status website.	PX
f.	Update Center electronic signs at gates.	PSCC
g.	Communicate with Brevard County EOC and SLD 45 regarding hurricane actions.	EOC
h.	Keep Center Director informed on matters concerning readiness; make recommendations as required	NEMO
i.	Ensure that all personnel on the ROT are sheltered at their designated locations.	EOC
j.	Check in with the EOC when all ROT members are initially in place, and regularly throughout the ride-out.	ROT POCs
k.	Monitor wind conditions and notify Security Police and Fire Service as conditions deteriorate.	EOC
l.	Notify EOC when determinations are made to shelter emergency personnel and suspend services.	Security Police/Fire
m.	Keep NASA Headquarters Office of Protective Services informed of KSC status.	NEMO
n.	Maintain accountability of all personnel, if possible.	Mgrs./Supvs

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APPENDIX F: **RECOVERY PHASE CHECKLIST**

The KSC recovery operations phase begins once the storm has passed, and the NEMO directs the ROT initial assessment element to conduct windshield surveys after the "Weather Safe" declaration. Based on initial survey findings and other pertinent factors, the NEMO and the DART Chief will determine whether a DART activation is required and will present their joint recommendation to the EDT. If DART is activated, KDP-KSC-P-3007, Damage Assessment and Recovery, will be implemented. Regardless of whether DART is activated or not, the Center Director's "All Clear" declaration will precede the reopening of the Center for normal business.

	ACTION	**ORG/POC**
a.	Convene a meeting of ROT initial assessment element leads, prior to "Weather Safe," to develop the plan for conducting windshield surveys reporting damages.	NEMO
b.	Advise Security Police, Fire, BOSS ROT Chief, and DART Chief that any facilities on NEMCON's prioritized facilities list must not be entered prior to IH assessment.	EOC
c.	Coordinate with Florida Department of Transportation in the Brevard County EOC on the status and timing of bridge/causeway inspections.	EOC
d.	Survey regional country EOCs for road status.	EOC
e.	Verify with CCSFS EOC regarding the status of their gates.	EOC
f.	Coordinate with DART Chief to determine whether DART activation is required.	NEMO
g.	Declare "All Clear" when the Center can be partially or entirely opened for normal business.	EDT
h.	Upon "All Clear" declaration, send Center-wide email announcement and update recorded telephone message on both lines.	EOC
i.	Upon "All Clear" declaration, update Center Status website.	PX
j.	Upon "All Clear" declaration, update Center electronic signs at gates.	PSCC

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APPENDIX G: **ROT STAFFING, SHELTERING, AND ACCOUNTABILITY**

Only the minimum number of essential personnel shall ride out a storm on Center. The ROT composition is dependent upon variables such as location of flight hardware/mission-critical resources, proximity of storm track, strength of storm, and availability of personnel. Organizations whose personnel typically comprise the ROT are listed below. Actual ROT staffing shall be a real-time decision, based on mission needs, at the discretion of individual organizations' management, and should be carefully considered for every storm. Organizations not listed in the table below may have ROT representation, as needed.

All organizations with ROT personnel must provide the EOC with numbers of personnel, shelter location(s), POCs, radio nets, call signs, and telephone numbers. ROT POCs must check in with the EOC when their teams are initially in place, and regularly throughout the ride-out.

ROT assembly time will be established prior to the expected onset of 35 kt (40 mph) at KSC. Individual ROT members should recognize that weather conditions may deteriorate sooner in other parts of the region and are encouraged to plan their travel to KSC accordingly.

All ROT personnel must shelter in designated hurricane shelters. The LCC (K6-0900) is KSC's primary hurricane shelter. When there is potential for major (Category 3, 4, or 5) hurricane impact at KSC, all ROT personnel shall shelter in the LCC. For storms of lesser expected impact, additional hurricane shelters are approved ride-out locations for certain organizations/functions, as shown below.

Hurricane Ride-Out Shelters	**Organizations**
Security Patrol HQ, K6-2496	Security Police
Fire Station #2, J6-2370	Fire/EMS
Communications Distribution and Switching Center (CD&SC), M6-0138	AEGIS
Communications Maintenance and Storage (CMS), M6-0791	AEGIS
VAB Utility Annex, K6-0947*	BOSS
Industrial Area Chiller Plant, M7-0407*	BOSS
Launch Control Center (LCC), K6-0900	BOSS AEGIS NEMO/Emergency Management 45th Weather Squadron PX Protective Services Communications Center NEMCON EGS/COMET Boeing SLD 45 General's "Silver CAT" CCSFS Ride Out Team (for Category 4 or 5)

*VAB Utility Annex and Industrial Area Chiller Plant may be approved for up to Category 3.

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APPENDIX H: **RIDE-OUT SUPPLY AND PROVISIONS**

BOSS Logistics will deliver shelter kits (comprising cots, blankets, flashlights, and batteries) to the following locations, in advance of a ride-out, and will coordinate with the EOC to ensure appropriate numbers of kits:

- LCC
- Fire Station #2 (cots only)
- Security Patrol HQ

Vehicles and support equipment necessary to perform ride-out or recovery actions are the responsibility of each organization.

When recalled, ROT personnel should bring necessary personal items in quantities sufficient to last a minimum of 72 hours. Recommended items include:

a. Toiletries

b. Food, snacks, and bottled water (if preferred over tap water)

c. Medications

d. Changes of clothing

e. Washcloth/towels

f. Any desired bedding, pillows, sheets, sleeping bag, etc.

g. Any desired battery-operated radio, personal devices, spare batteries, chargers, and earphones

h. Any desired slippers or shower shoes, or similar footwear

The following shall not be allowed:

a. Dependents

b. Alcoholic beverages

c. Weapons

d. Pets/animals

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APPENDIX I: CRITICAL FACILITIES REQUIRING SHUTTERS

The facilities listed below are authorized to receive shutters. No other facilities shall receive shutters unless coordinated through the EOC. Facility managers are responsible for ensuring shutters are installed on their respective facilities. Shutters shall be installed at HURCON II.

Organizations with new requirements or changes to the current shutter list shall make their requirements known, by email to KSC-EOC@mail.nasa.gov, by May 15 each year.

KSC Shutter/Critical Facility Listing

Building	Building Name	Shutters
M6-0138	Communications Distribution and Switching Center (CD&SC)	6
M6-0495	Dispensary (Occupational Health Facility)	13
M6-0883	KSC Child Development Center	41
K6-0900	LCC	21
K6-2496	Security Patrol Headquarters	4
L6-0146	Engineering and Admin Building (Booster Fabrication Facility)	51
	Total:	136

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APPENDIX J**: GENERATOR PLAN**

Depending upon the size and strength of a particular storm, portable generators *may* be used for critical flight hardware and high-value and mission-critical assets.

Directorates or organizations with portable generator requirements other than the permanently installed generators listed below shall make their requirements known by emailing the Generator Request Form, Appendix K, by May 15 each year, to KSC-EOC@mail.nasa.gov. Facility Managers need to coordinate buildings and facilities to be surveyed by the Electrical Shop and Power Production to ensure portable generator requirements are known.

KSC Permanently Installed Generators

Location	Facility Location	Rating		Function
		Kilowatts	Volts	
E4-2414A	Emergency Generator Bldg. at the Haulover Bridge	60	480	Entire Facility
M3-0147	Emergency Generator Bldg. at the Indian River Bridge	200	480	Entire Facility
M6-0495D	Emergency Generator Bldg. at the Dispensary (Occupational Health Facility)	205	208	Portion of Facility
M7-0301	KSC Central Campus Headquarters Bldg. (West Side)	800	480	Portion of Facility (Critical Loads)
M6-0547	Kennedy Data Center	380 (2)	Variable	Entire Facility
K6-1091	Emergency Power Station at the C5 – Emergency Power Plant	2000	13,800 5 each	Backup Feeders A1, 518, 612, 618, 614
H2-1245	Generator Bldg. at the Jay Jay Railroad Bridge	90	208	Entire Facility
N6-2296	Central Telemetry Building 4	900	480 2 each	Entire Facility
J6-2370	Fire Station #2	230	208	Entire Facility
J6-0490A	500-Foot Weather Tower	125	480	Tower
K7-1203	Emergency Generator Bldg. at the Press Site	500	480 2 each	Entire Facility
M6-0493C	Emergency Generator Bldg. at the Industrial Area Support Building	60	208	Food Freezers
M6-0139	Emergency Generator Bldg. at the CD&SC	350	480 3 each	Entire Facility
M6-0791	Emergency Generator at the Communications Maintenance and Storage	7.5	208	Radio Tower

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Location	Facility	Rating		Function
		Kilowatts	Volts	
C2-1306	Emergency Generator Bldg. at the Radar Tower	135	208	Entire Facility
M6-0342D	Generator Enclosure #1	250	208	Portion of Facility
M6-0342D	Generator Enclosure #2	350	480	Portion of Facility
M7-0355	Emergency Generator at the Neil Armstrong Operations and Checkout Bldg.	150	480 2 each	Portion of Facility
M7-0360	Space Station Processing Facility, Life Safety	150	480	Portion of Facility
M7-0360	Space Station Processing Facility, 1.2 M Site	1200	480	Portion of Facility
M7-0360	Space Station Processing Facility, 2.0 M Site	2000	4160	Portion of Facility
M7-1354	Payload Hazardous Servicing Facility	1000	480	Entire Facility
M6-0336	Electromagnetic Lab	60	208	Portion of Facility
M7-0531	Banana River Repeater Station	60	208	Entire Facility

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APPENDIX K: GENERATOR REQUEST FORM

GENERATOR REQUEST FORM

Date: _____

TO: KSC Emergency Management
EMAIL: KSC-EOC@mail.nasa.gov

FROM: _____

SUBJECT: REQUEST FOR GENERATOR SUPPORT FOR HURRICANE PREPARATION

Request generator for Building #_____

Area of location:
_____

Generator size: _____ KW: _____

Generator disconnects installed on the facility? Yes/No _____

Generator tie-down anchors installed to secure generator? Yes/No _____

Point of contact: _____ Phone: _____

JUSTIFICATION:

Note: Installation of generator disconnect switches and power cables on required facilities are required for effective hurricane preparation. A tag will be installed on the disconnect switch stating generator size, voltage, and phase rotation (CW or CCW).

Office of Primary Responsibility (OPR)

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APPENDIX L**: VEHICLE PARKING PLAN**

NASA KIOSK VEHICLES
At HURCON III, 80 NASA vehicles (including as many SUVs as possible) will be pre-staged on the west side of the Neil Armstrong Operations and Checkout Building (O&C) building, for use during DART operations. Keys for these vehicles will be left in the driver side visors. Mileage logs will be provided in each of these vehicles, and vehicle operators will maintain these logs daily until the vehicles are no longer needed for DART.

ALL OTHER GOV AND GSA VEHICLES
All organizations and contractors that possess and use GOV and GSA vehicles are responsible for the care and protection of the vehicles. Parking inside is the preferred method for wind protection, but the major concern is storm surge. Golf carts, tugs, forklifts, and other low speed vehicles will be sheltered by the user. If it is not feasible to evacuate or shuttle these vehicles to alternate locations, the following procedures shall apply to securing vehicles.

When Hurricane Condition III is declared any, vehicles not in use shall be fully fueled, parked with parking brake set, doors unlocked, and keys above the driver side visors..

The following parking areas are designated as parking sites for GOV and GSA vehicles that are not moved to areas west of KSC.

a. KSC Central Campus Headquarters Building parking lots: All vehicles normally parked in the KSC parking lots each night shall be parked in the usual parking spaces.

b. O&C Parking Lot, South and East sides: All vehicles normally parked in the south and east parking lots, plus all vehicles normally parked on the west side between the O&C and the KSC Training Auditorium, shall be parked in their usual parking spaces.

c. Central Instrumentation Facility Parking Lot: All vehicles normally parked in the Central Instrumentation Facility parking lot each night shall be parked in their usual parking spaces.

d. BOSS Parking: All vehicles assigned to the BOSS contract shall remain in their usual parking spaces except for those specified in paragraphs f and g.

e. Central Supply: Central Supply and delivery vehicles shall be parked in the field west of the building.

f. VAB Parking Site: All vehicles normally parked inside the VAB fenced area shall be relocated and parked in the large parking lot (Area C parking lot) in front, and to the south, of the VAB. (The VAB Inside Parking Plan is developed by facility manager.)

g. Vehicles in the Launch Complex 39 area will be parked in their normal parking spaces. Vehicles located east of the Converter Compressor Facility shall be parked in the Area C parking lot in front and to the south of the VAB.

h. Exploration Ground System (EGS) Logistics Facility Parking Lot: All EGS and COMET vehicles assigned to EGS Logistics Facility shall use their normal parking spaces. All COMET delivery vehicles shall be parked on the tarmac south of the EGS Logistics Facility.

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i. Fire Department, Occupational Health, Environmental Health, and Security Police: All vehicles shall be parked and secured at their respective facilities and parking areas.

j. Base Support Building (M6-0486): All vehicles normally parked in the Maintenance and Operations Building operations area shall be parked in the parking lot east of the Base Support Building.

k. Heavy Equipment Shop (K6-1996): All vehicles normally parked in K6-1996 parking lot shall remain in this area.

l. Supply Warehouse #2 (M6-0698): All vehicles shall be parked in the open area immediately east of the warehouse.

m. NASA vehicles normally parked at NASA facilities on CCSFS shall be parked in the east parking lot of the Space Station Processing Facility.

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APPENDIX M**: DEFINITIONS OF TERMS**

All: Individuals and organization tasked with a specific function during hurricane preparations.

"All Clear": This declaration is made by the Center Director when the EDT, with advice from the NEMO and the DART Chief, determines that recovery efforts have resulted in the ability to safely reopen some or all of KSC for normal business.

Damage Assessment and Recovery Team (DART): Individuals with uniquely specialized skills who are identified by their organizational managers to return to KSC following a storm to restore the infrastructure, assess damage, safe systems, and bring the Center back online.

Damage Assessment Team: This team is composed of engineers with structural, mechanical, electrical, and cost-estimating skills who assess monetary damages to the Center and provide an overall cost estimate to senior management. The composition of the Damage Assessment Team membership is drawn from the DART.

Emergency Decision Team (EDT): The EDT includes the KSC Center Director, KSC senior management, and representation from contractor senior management. The EDT is convened when any significant threat to KSC is determined to exist or is imminent. The EDT makes recommendations to the Center Director.

Emergency Management Office: NPSC-SR personnel tasked with the contractual responsibility for emergency management, operating the EOC, writing and updating plans and procedures, providing training, and responding to emergencies.

Emergency Operations Center (EOC): The EOC is the focal point for hurricane preparation and response. For hurricane operations, the EOC is located in the LCC, Building K6-0900, Room 2R21. When activated, the EOC's telephone number is 321-867-9200/9201.

Emergency Responders: KSC firefighters, security police, paramedics, emergency medical technicians, public health professionals, and others as required, dispatched to the scene of an incident site.

NASA Emergency Management Officer (NEMO): NASA person responsible for emergency management on KSC. This individual is also known as the Emergency Management Program Manager and is delegated in the KSC Business World as the Emergency Preparedness Officer and Center Continuity of Operations Coordinator.

NASA Protective Services Office (PSO): This office includes Center Security Police, Emergency Management, Fire Protection, and Fire Authority Having Jurisdiction.

Nonessential Personnel: Government and contractor personnel who have no assigned duties to perform for preparation for, response to, and recovery from a tropical storm or hurricane affecting KSC.

Protective Services Control Center (PSCC): This control center is located at the KSC LCC, Building K6-0900, Room 2P10. This center receives all emergency calls (911) on KSC and dispatches/notifies emergency responders according to Standard Operating Procedures. The PSCC also provides support to the IC during an emergency.

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ROT Initial Assessment Element: Those individuals on the Ride-Out Team who conduct Center-wide surveys, identify damages, and report findings to the EOC after "Weather Safe" has been declared. This team generally comprises of Security Police, Fire Services, BOSS, NEMCON, and AEGIS.

"Weather Safe": This term is used to denote that the storm winds have subsided to a safe level so that Ride-Out Team members can go outside their sheltered locations to assess damages. This declaration is made by the NEMO, based on weather data and advice from the embedded 45th Weather Squadron forecasters. At his discretion, the NEMO will generally make this declaration when sustained surface winds (measured at 54 ft or below) in excess of 35 kt (40 mph) have subsided.

WebEOC: A registered trademark software program that is used, operated, and maintained by the KSC Emergency Management Office. This Web-based program is a commercial off-the-shelf work management program used to record preparedness, response, and recovery actions, as well as to access links to hurricane plotting, training, and real-time HURCON status updates.

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APPENDIX N: ACRONYMS AND ABBREVIATIONS

AEGIS	Advanced Enterprise Global Information Technology Solutions
BOSS	Base Operations & Spaceport Services
CAT	Hurricane Category
CCSFS	Cape Canaveral Space Force Station
CD&SC	Communications Distribution and Switching Center
COMET	Consolidated Operations, Management, Engineering, and Test
CSF	Central Supply Facility
DART	Damage Assessment and Recovery Team
EDT	Emergency Decision Team
EMF	Electrical Maintenance Facility
EOC	Emergency Operations Center
GOV	Government-Owned Vehicle
GSA	General Services Administration
HC	Hurricane Coordinator
HURCON	Hurricane Condition
IC	Incident Commander
IT	Information Technology and Communications Services
KSC	Kennedy Space Center
KDP	Kennedy Documented Procedures
NEMCON	NASA Environmental and Medical Contract
kt	Knot
LCC	Launch Control Center
Mgrs.	Managers
mph	Miles per hour
NASA	National Aeronautics and Space Administration
NEMO	NASA Emergency Management Officer
NPSC-SR	NASA Protective Services Contract – Southeast Region
OIS	Operational Intercom System
PAWS	Paging and Area Warning System
PLN	Plan
POC	Point of Contact
PX	Center Engagement and Business Integration Services directorate, KSC
PSCC	Protective Services Control Center
ROT	Ride-Out Team
SD	Storm Dependent
SI	Spaceport Integration and Services directorate, KSC
SLD 45	Space Launch Delta 45
SSPF	Space Station Processing Facility
Supvs.	Supervisors
TS	Tropical Storm
UA	Utility Annex
USF	Utility Shop Facility
VAB	Vehicle Assembly Building

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