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“Astronauts’ worst day must be our best”

By Mary McHale, Joint Task Force-Space Transportation System Public Affairs

CAPE CANAVERAL AIR FORCE STATION, Fla. –
“Find in three hours or less; rescue in six hours or less.”

It’s the mantra that drives the mission of the Joint Task Force – Space Transportation System team for each launch and landing of a NASA manned space shuttle.

Should NASA require it, the JTF team of professionals directs and coordinates an array of search and rescue personnel, equipment and support to the astronauts upon shuttle launch, on orbit, and return to earth.



A Department of Defense entity, the JTF is assigned to U.S. Northern Command and includes people and assets from active duty military, Guard, Reserve and federal civil servants. During STS missions, the core of the JTF operates from the Morrell Operations Center at Cape Canaveral Air Force Station, Fla.,

Pat Merrigan, JTF-STs lead search and rescue planner from USNORTHCOM, said that with all SAR missions, the objective is to utilize all available assets to provide the most efficient and effective search and rescue action plan(s) as possible. To accomplish this task, he plans and coordinates with several other JTF team members as well as various federal agencies.

“It’s truly a unified effort,” said Mr. Merrigan. “Along with myself, there are SAR planners from the U.S. Coast Guard and each of the military services and federal agencies. Together we work to develop an actionable plan based on established national directives, plans, and personal knowledge and experience.”

From the inception of U.S. human space flight, NASA has always requested DOD support to their missions. DoD support to civil SAR for NASA is provided by JTF-STs. In the event of a shuttle emergency, to include astronaut bail-outs (what’s known as a Mode VIII scenario) and maritime SAR, JTF- STs is fully prepared to respond with a diverse array of resources – from U.S. Coast Guard maritime surface and air assets to DoD, Reserve, and National Guard fixed and rotary wing aircraft, flight medical doctors, pararescuemen, and KC-130 aerial refuelers.

Additionally, all commercial vessels of opportunity that may be in a position to assist are also considered potential SAR assets.

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“This is when the astronauts’ worst day has to be our best day,” said Col. Robert Lipira, JTF-STC deputy commander and J3 director of operations.

To prepare for this possibility, Mr. Merrigan said the entire JTF team participates in the Mode VIII exercise at Cape Canaveral AFS, which is usually conducted two days prior to launch.

“We usually start planning the exercise one month out,” he said. “While the scenarios are predominantly maritime based and within U.S. Coast Guard Search & Rescue Regions, all JTF members are given their inputs and individual exercise objectives to ensure we build a challenging, realistic scenario that is an effective learning tool for the entire team.”

To that end, the exercise evaluates the full spectrum of JTF team members to find out how effectively and efficiently the contingency information is collected, coordinated and ultimately communicated to all who require it.

“Once a Mode VIII is declared, we immediately begin collecting data from NASA and several other sources to calculate probable search locations,” he said. “While the primary goal is get on scene in a timely manner, we need all available data to develop the most refined search patterns for participating assets as is possible and ultimately achieve the highest probability of success.

Required data includes not only what assets are available to respond but current weather conditions that will impact the effectiveness of those assets as well as astronaut survival – both seaborne and airborne – such as visibility, winds, precipitation, sea current strength, wave heights, and sea and air temperature.

“There can be demanding search conditions involving poor weather conditions, limited communications, sea states, and illumination,” said Mr. Merrigan. “Time is a critical factor, especially at sea where surface winds and sea currents vary greatly and must be constantly accounted for during SAR cases at sea. Maritime search areas expand exponentially over a very short period of time.”

U.S. Navy Lt. John Harrington from Fleet Replacement Squadron, Helicopter Maritime Strike Squadron - 40, Jacksonville Fla., is one of the JTF-STC members who helps provide this initial information. A Coast Guard SAR planning school graduate and an SH-60 Bravo helicopter pilot, he provides the other team members calculations regarding astronaut chute trajectory drift in the ocean.

“I integrate with the joint task force and provide a Navy SAR asset to provide an aerospace trajectory drift calculation to the SAR team,” said Lieutenant Harrington. “I provide the chute drift upon ejection and then calculate a point where I think is the most likely point of the astronauts’ location upon departure. From there, I give that information to the JTF commander so he can combine it with his other information to the SAR search action plans.”

Mr. Merrigan said the additional information is derived from previous communications and coordination with a variety of agencies.

“Aside from our SAR assets, we also maintain awareness of other potential SAR assets that may be requested to assist based on coordination and calls we make hours prior to the launch. We have to depend on every available resource we know about since our goal is to heighten the probability of detection and success as much as possible,” he said.

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To help the team and JTF-STC commander maintain situational awareness about all available resources during the operation, there is the common operating picture manager. The manager receives, coordinates, tracks and maintains a real-time visual computer display of all assets. It's displayed on an elevated screen for all task force members to view.

"My job is to collect and coordinate the inputs from team members and provide the visual image of the operating area, to include all maritime and aerial assets," said Col. Nathan Lindsay, JTF-STC COP manager. "It displays real-time imagery of the location of all our assets to provide the JTF instantly-updated information to further enhance the decision-making process during the operation."

"Our SAR response really depends on how the event develops, there are so many variables," Mr. Merrigan said. "Our main focus is on the safety of astronauts. However the situation may develop, we are prepared to respond in the most effective and efficient manner. The SAR team consists of highly skilled and proficient people. It's what we train for."

The JTF-STC team is poised to participate in NASA's final Space Shuttle launch – STS-135 – which will mark the end of the shuttle program. Space Shuttle Atlantis is scheduled to deliver supplies, logistics and spare parts to the International Space Station July 8.