



**SCIFLI - Hayabusa 2 Airborne Re-entry
observation Campaign
(SHARC)**

Deployment Safety Plan

10/22/2020

Revision History			
Rev.	Description of Change	Author(s)	Effective Date
-	Initial Release	J. Zavaleta, Q. Allison, C. Murphy	09/10/20
1	Added descriptive explanation to section C3. Minor typos, better phrasing.	J. Zavaleta, Q. Allison, C. Murphy	09/15/20
2	(3.2.3) Details of international travel insurance for CS. (2.1) Australian & SHARC's guidelines (3.4.3) Transportation of PPE to Australia. 3.8 Facilities (C.4) Update policy on isolation. General wording: changed "should" to "will" and other word corrections	J. Zavaleta, Q. Allison, C. Murphy	09/25/20
3	(2.3) Revised wording about adherence to the most restrictive safety plan.	J. Zavaleta, Q. Allison, C. Murphy	9/30/20
3	(3.8.2) Removed unnecessary sentences.	J. Zavaleta, Q. Allison, C. Murphy	9/30/20
3	Updated personnel list	J. Zavaleta	9/30/20
4	(2.1.2) Changed wording from "the same" to "very similar" with regards to social distancing protocols	J. Zavaleta	10/1/20
4	General wording: changed "should" to "will"	J. Zavaleta	10/1/20
5	(3.9.2) Updated hotel information- Playford to the InterContinental; (3.3.3) one test before deployment; (3.3.7.1) Carpooling within team bubbles	C. Murphy	10/15/20
6	(3.3.8) Clarified public event vs VIP events in Australia. (3.4) Updated facial coverings to reflect local conditions. (D4, D5, D9): Updated personnel Primary & Alternate roles	J. Zavaleta	10/22/20

Table of Contents

1. Project Overview	5
1.1. Criticality of Investigation	6
2. Purpose and Scope	6
2.1. Application of SCIFLI - Hayabusa 2 Airborne Re-entry observation Campaign (SHARC) Return-to-Deployment Plan for Adelaide, Australia	6
2.2. Mission Schedule Overview	7
2.3. Ames Research Center Travel Requests	9
2.4. Safety Guidance at Other NASA Centers and Onboard other Center Aircraft	10
3. COVID-19 Protocols and Mitigations	10
3.1. Mitigating Covid-19 Risks	10
3.2. Health Monitoring	11
3.3. Social Distancing	12
3.4. Personal Protective Equipment (PPE)	14
3.5. Cleaning/Hygiene Protocols	14
3.6. Communication and COVID-19 Emergency Preparedness/Response	15
3.7. Training / Informing Mission Participants	16
3.8. Facilities	17
3.9. Hotels (Mandatory Quarantine and Deployment)	17
Appendix A. Further Information on Social Distancing Protocols	18
A.1. Workspace Layout	18
Appendix B. Further Information on Cleaning Protocols	19
B.1. General Cleaning Guidelines	19
B.2. Cleaning a Private Workspace	19
B.3. Cleaning a Shared Workspace	20
B.4. Enhanced Cleaning	20
Appendix C. COVID-19 Emergency Response Plan	21
C.1. COVID-19 Symptoms	21
C.2. Sickness or Confirmed COVID-19 Test Prior to Travel	21
C.3. Sickness or Confirmed COVID-19 Test During Integration and Deployment	22
C.4. Sickness or Confirmed COVID-19 while in Transit	24
Appendix D. Miscellaneous	24
D.1. Prerequisites for Safe Return to Deployment/On-site Work	24
D.2. Nominal Work Day Schedule	25
D.3. NASA Ames Research Center Personnel Contract Details	25
D.4. NASA Ames Research Center Mission Participants	25
D.5. NASA Glenn Research Center Mission Participants	27
D.6. NASA Johnson Space Center Mission Participants	27
D.7. NASA Langley Research Center Mission Participants	27
D.8. JAXA Mission Participants	29
D.9. MARS Scientific (NASA Contractors) Mission Participants	29

Appendix E. Mission Critical Letter

30

Appendix F. Acronym List

32

1. Project Overview

The Hayabusa2 Sample Return Capsule (SRC) Earth atmospheric entry is a one-time event that will occur on December 6, 2020. NASA aircraft observations of the SRC entry are an integral component of a larger international collaboration between the National Aeronautics and Space Administration (NASA) and the Japan Aerospace Exploration Agency (JAXA) in accordance with a Memorandum of Understanding (MOU) between the two organizations.

The Scientifically Calibrated In-FLight Imagery (SCIFLI) team at NASA Langley Research Center (LaRC) has been tasked to conduct the re-entry observation of the Hayabusa SRC. The SCIFLI- Hayabusa2 Airborne Re-entry observation Campaign (SHARC), utilizing two NASA Gulfstream III (G-III) aircraft, the Langley Research Center (LaRC) G-III (N520NA) and the Johnson Space Center (JSC) G-III (N992NA), seeks to acquire spectroscopic and trajectory reconstruction data during the SRC return to Earth in the RAAF (Royal Australian Air Force) Woomera Range Complex of Australia on 6 December 2020.

The datasets derived from the calibrated imagery collected during this “one shot” reentry opportunity support the Science Mission Directorate’s Planetary Science Division and the Space Technology Mission Directorate’s Entry Systems Modeling (ESM) project by providing unique and unprecedented flight measurements associated with the high energy physics of atmospheric entry from superorbital return velocities. Spectral emissions from the capsule’s thermal protection system (TPS) surfaces and the surrounding plasma environment will provide verification data to more confidently and cost-effectively enable future missions to destinations within our solar system.

In order to complete preparations for deployment in mid-November 2020, aircraft preparation/modification/maintenance and instrument integration activities must be conducted at various NASA Centers, beginning immediately. The novel coronavirus pandemic (COVID-19) impacts to the project have already required transitioning from the NASA DC-8 aircraft platform to two G-III aircraft, largely consuming the project’s schedule margins. Further delays will jeopardize the SCIFLI team’s ability to integrate the NASA and JAXA instruments, obtain the necessary travel approvals, and forward deploy to Australia with sufficient time to accommodate international quarantine restrictions.

The NASA Ames Research Center Earth Science Project Office (ESPO) is managing SHARC’s ground operations of the deployment phase out of Adelaide’s International Airport. This Deployment Safety Plan provides a description of the measures and processes in place to minimize the risk of COVID-19 infection during the SHARC international deployment. SHARC mission participants will include Civil Servants and Contractors traveling from Ames Research

Center (ARC), Johnson Space Center (JSC), Langley Research Center (LaRC), Glenn Research Center (GRC), and Japan Aerospace Exploration Agency (JAXA).

A detailed list of SHARC personnel, their organization and functions is presented in Appendix D of this document. The deployment schedule is shown below in section 2.2.

1.1. Criticality of Investigation

On August 09, 2020, Dr. Lori S. Glaze, Director, Planetary Science Division at NASA HQ, classified the SCIFLI-Hayabusa2 project (SCIFLI Hayabusa2 Airborne Re-entry Observation Campaign (**SHARC**)) as Mission Critical (see Appendix E) Observation of the re-entry cannot be delayed or performed remotely.

2. Purpose and Scope

2.1. Application of SCIFLI - Hayabusa 2 Airborne Re-entry observation Campaign (SHARC) Return-to-Deployment Plan for Adelaide, Australia

The purpose of this document is to describe the SHARC Safety Plan to mitigate the transmission risk of COVID-19 to/from personnel supporting SHARC airborne operations and airborne support activities while on the ground in Adelaide, Australia. It also covers participants flying commercially to and from Adelaide, and Ames Research Center SHARC participants when traveling to other centers. It is understood that those working at other centers and flying on the G-III aircraft will abide by the rules and regulations of the aircraft's home centers, LaRC and JSC, respectively, as well as the countries where the aircraft will stop en route. More information on the LaRC and JSC plans are available in section 2.4 of this plan.

When working on deployment in Adelaide, Australia, all SHARC participants will be required to follow the rules and regulations for onsite work and safety found in this plan. There are two exceptions to this rule:

1. JSC and LaRC rules apply for any work that occurs on each center's respective aircraft while these aircraft are in Adelaide, Australia.
2. If a specific Return To On-site Work (RTOW) safety rule from another center, participating institution, or local authority is stricter than the SHARC rule, then this rule will supersede the SHARC rule for that center or institution's employees during their SHARC deployment in Adelaide as long as it does not present a risk to the safe execution of flight operations. Current COVID-19 guidance for local policies in Adelaide are very similar to the ones described in these document, they may be found here: <https://www.covid-19.sa.gov.au/restrictions-and-responsibilities/activities-and-gatherings>

2.2. Mission Schedule Overview

The SHARC operations are split into five distinct mission phases: integration, transit to Adelaide, deployment, transit from Adelaide, and deintegration. The *integration phase*, which will occur on site at NASA JSC and NASA LaRC, is nominally scheduled from **November 2 through November 11**. *Transit to Adelaide* is scheduled to occur between **November 6 and November 27** with teams arriving in three groups at different dates: ESPO group arriving via commercial flights, SHARC instrument and science teams arriving in commercial flights, and SHARC aircraft teams arriving onboard NASA aircraft.

As of September 15, 2020 the project management is looking into the feasibility of chartering an aircraft to transport about 12 personnel to Australia in order to mitigate some uncertainties related to the potential risk of double quarantines. Double quarantines present a possible issue to travelers to Adelaide because there is currently a limited number of weekly flights into territories that don't require quarantine in Adelaide after a mandatory quarantine at the point of entry. Also, the situation could change between now and the deployment. This decision will be finalized closer to the start of the mission. The decision to charter an aircraft will not impact the application of this document. While aboard the chartered aircraft the current rules and regulations of the airline industry and the aircraft operator will apply. Additional precautions, not outlined by the carrier, may be taken by personnel, provided that it does not interfere with the aircraft operations and the carrier does not restrict it.

Participants will undergo an Australian government mandatory 14-day quarantine upon arrival to Australia; further details are provided in section 3.9. The Earth Science Project Office (ESPO) team will arrive a week before other teams to begin setting up the deployment site and making final arrangements for the deployment. The *deployment phase*, which will occur in Adelaide, Australia is scheduled from **November 30 – December 7**. Transit return to the US from Adelaide, Australia will occur at the same time for all teams leaving **December 8**. Once all teams and aircraft have arrived back at their designated centers, the de-integration phase will begin on **December 10** at NASA JSC and NASA LaRC. A detailed mission schedule can be found at <https://espo.nasa.gov/sharc/calendar/2020-11> and in the table below.

The table below is to clarify which safety plan applies during which part of the mission.

Mission Stage	Dates (teams) locations	Primary Safety Plan
Integration	November 2- November 11 (Instrument, shipping and aircraft teams) LaRC	Langley Research Center-LARC Safety Plan

	November 2- November 11 (Instrument, shipping, and aircraft teams) JSC	Johnson Space Center- JSC Safety Plan
Transit to Australia	<p>November 7 (ESPO) Commercial flight- US to AU. Route TBD.</p> <p>November 14 (Mission Scientists, Instrument, and Operations teams) Commercial flight- US and Japan to AU. Route TBD.</p> <p>November 27* (NASA aircraft N520NA and respective crew) Government aircraft- US to AU. Route TBD.</p> <p>November 27* (NASA aircraft N992NA and respective crew) Government aircraft- US to AU. Route TBD.</p>	<p>Commercial Fliers- SHARC Deployment Safety Plan and airport regulations</p> <p>Commercial Fliers- SHARC Deployment Safety Plan and airport regulations</p> <p>G-III (N520NA)- LARC Safety Plan</p> <p>G-III (N992NA)- JSC Safety Plan</p>
Deployment-	November 23- December 8 (ESPO, Mission Scientists, Instrument, Operation teams and aircraft crews) Adelaide International Airport and the Playford Hotel Adelaide, Australia	<p>On ground- SHARC Deployment Health Safety Plan</p> <p>G-III (N520NA)- LARC Safety Plan</p> <p>G-III (N992NA)- JSC Safety Plan</p>
Transit from Australia	<p>December 8- December 10 (ESPO, Mission Scientists, Instrument, and Operations teams) Commercial flight- AU to US and Japan</p> <p>December 8- December 10 (NASA aircraft N520NA and respective crew) Government aircraft- AU to US</p>	<p>Commercial Fliers- SHARC Deployment Safety Plan and airport regulations</p> <p>G-III (N520NA)- LARC Safety Plan</p> <p>G-III (N992NA)- JSC Safety Plan</p>

	December 8- December 10 (NASA aircraft N922NA and respective crew) Government aircraft- AU to US	
De-integration	December 10- January 4 (Instrument, shipping and aircraft teams) LaRC December 10- January 4 (Instrument, shipping and aircraft teams) JSC	Langley Research Center-LARC Safety Plan Johnson Space Center-JSC Safety Plan

This Safety Plan is and will continue to be applicable to SHARC on-deployment mission operations in Adelaide, Australia, during Stages 1-3 as defined by [NASA's Framework for RTOW](#).

2.3. Ames Research Center Travel Requests

The scope of this document includes requesting travel to and from the following NASA facilities and airports for NASA Ames Research Center (ARC) Civil Servants and contractors for the following limited activities:

2.3.1. Aircraft Communications Testing (at LaRC & JSC) Nov 2 - Nov 11, 2020

Mission Role	Primary Personnel	Alternate Personnel
Instrument Integration- Satellite Communications	Dave Van Gilst (BAERI)	Carl Sorenson (USRA)
Instrument Integration- Satellite Communications	Carl Sorenson (USRA)	Dave Van Gilst (BAERI)

2.3.2. SHARC deployment support (at Adelaide, Southern Australia) Nov 7- Dec 8, 2020

Mission Role	Primary Personnel	Alternate Personnel
Mission Support Project Manager	Jhony Zavaleta (ARC NASA)	Quincy Allison (BAERI)/ Caitlin Murphy (BAERI)
Deputy Project Manager	Quincy Allison (BAERI)	Caitlin Murphy (BAERI)
Project Coordinator	Caitlin Murphy (BAERI)	Quincy Allison (BAERI)
Mission Principal Investigator		Jay Grinstead (ARC NASA)

When doing work at a location away from Ames, Ames employees will comply with whichever COVID-19 safety rules are most restrictive. Note Exception 1 in section 2.1

A full list of mission participants and a breakdown of the deployment work schedule can be found in Appendix D.

2.4. Safety Guidance at Other NASA Centers and Onboard other Center Aircraft

2.4.1. Integration safety plans will be developed and implemented by the host centers, in this case Johnson Space Center and Langley Research Center. Additionally, each aircraft group will coordinate with their respective Centers on the development and implementation of a COVID-19 Safety Plan.

2.4.2. If a passenger or crew member on the G-III 520NA or the G-III 922NA becomes sick while in transit to Australia, that aircraft's home center safety plan, as well as the local rules of the aircraft's location will apply. Refer to section C3 of this document for more details.

2.4.3. All safety plans mentioned above and which are outside the scope of this document can be made available by the ESPO deployment support project manager, Jhony Zavaleta jhony.r.zavaleta@nasa.gov, upon request.

3. COVID-19 Protocols and Mitigations

3.1. Mitigating Covid-19 Risks

3.1.1. In an effort to mitigate the transmission risk of COVID-19 to/from SHARC participants, an evaluation of mission personnel and functions was performed to determine who is required in the field to carry out the mission objectives, and in what areas travel can be reduced or eliminated.

3.1.2. Only personnel required in the field to perform essential hands-on work will be traveling to the integration centers and the deployment site. Alternates for each essential role have been identified and will be on standby in the event that one of the primary personnel can no longer travel. Those that can perform dual roles without hindering the ability of the other, will also be utilized in the event that a SHARC member becomes ill during the deployment. Those that can perform their roles remotely will do so.

3.1.3. In preparation for the mission, JAXA personnel had intended to travel from Japan to the US to integrate their instruments onto the aircraft, and then travel to Adelaide, Australia. Instead, JAXA personnel will ship their instruments to JSC and fly directly to the deployment site in Australia. The JAXA instrument integration, post-mission

de-integration, and return shipment of such instruments to Japan will be handled by JSC personnel.

3.1.4. Teams will continuously assess their personnel needs up to the departure date to minimize the number of personnel to deploy.

3.1.5. For general reference and context, the local measures in Australia, including Adelaide are very similar to the ones in place around the US, and many times it is more restrictive. For example, all international arrivals are mandated to a 14-day quarantine period. Adelaide applies the same mandatory quarantine to any Australians arriving from other territories (only Tasmania, Queensland, and Western Australia are exempt), and arrivals are tested before the quarantine is lifted. Physical distancing, regular handwashing, teleworking, etc are common practice. As of September 14, there have been 466 cases and 4 deaths related to COVID-19, the great majority of the cases were acquired overseas. <https://www.covid-19.sa.gov.au/home/dashboard>

3.2. Health Monitoring

3.2.1. Approval to fly on any of the NASA aircraft in this mission requires the current medical clearance procedure for that aircraft and its home organization.

3.2.2. As with all the ESPO managed missions, mission participants may obtain a pre-authorization from their medical insurance provider for a medical facility of their choice in Adelaide which is covered by their insurance plan.

3.2.3. The mission will cover as a reimbursable expense, optional Travel Health insurance for those participating contractors that deem their health coverage as insufficient. Optional Travel Health Insurance such as <https://www.gebluetravelinsurance.com/products/single-trip/voyager-quote-results.cfm?gid=i8Zf9Ez4Up1916727> covers a wide variety of medical treatments including COVID-19 testing and treatments at moderate rates of about \$120 USD for up to a \$1M of coverage. Current NASA rules prevent the project from providing the coverage to Civil Servants. Civil Servants on official international travel are currently covered by International SOS. For details, visit <https://inside.nasa.gov/information-nasa-civil-service-employees-international-business-travel#close>.

3.2.4. All mission personnel (including designated alternates) who plan to travel to support operations, and who fall into any one of the health risk categories listed at <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/groups-at-higher-risk.html> will be discouraged from traveling. If any individual in this category still chooses to participate, it will be recommended to them that they consult their physician to understand the risks involved.

3.2.5. Beginning 14 days prior to travel, all mission personnel will conduct a daily self-assessment of their health using the guidelines found at <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>.

Individuals who feel ill will follow the guidelines found in the COVID-19 Emergency Response Plan (Appendix C).

3.2.6. As noted above, all key SHARC mission personnel have alternate personnel identified in case of illness (see Appendix D). This measure is necessary to mitigate the risk caused by the more urgent need to minimally staff the deployment for health safety considerations.

3.3. Social Distancing¹

3.3.1. Prior to traveling in support of all mission activities, all mission participants – to the greatest extent possible – will 1) self-quarantine for 14 days; 2) wear facial coverings (cloth masks or non-sterile disposable masks) when outside of their home and 3) stay at least six feet apart from anyone outside of their household. In addition, all personnel will agree to strictly adhere to all applicable local public health orders and institutional rules designed to reduce the transmission risk of COVID-19. **Agreement is implicit in participation.**

3.3.2. In cases where it is necessary for individuals to take a commercial flight to the SHARC deployment, it is required that mission participants wear facial coverings (e.g., cloth masks or non-sterile disposable masks) during the entire flight and throughout airports. It will also be recommended that travelers bring a supply of disinfectant wipes to clean commonly used surfaces. Other air travel precautions (use, layered, disposable gloves for high touch areas in airports, etc.) are left to the institutions/travelers themselves. NASA and the project will accommodate and reimburse these needs as regulation/policy allows.

3.3.3. Participants will take one COVID-19 test prior to departing for Australia.

3.3.4. Mission participants will maintain - as best as possible - a six foot separation from all others at all times while participating in the mission. If for any reason it becomes necessary for personnel to work within six feet of each other, a face shield or goggles, in addition to an appropriate face covering, will be required.

3.3.5. Teams will be encouraged to compartmentalize and form **social bubbles/quaranteams** to the greatest extent possible. Interactions between on-site teams who are not directly working together will be discouraged.

¹ Social distancing rules and regulations for activities at mission participants' home institutions or at NASA centers supporting instrument integration will be governed by the respective institutional or centerwide policies.

3.3.5. Meetings involving project leadership, mission science teams, flight crews and QNCs will occur locally and remotely.

3.3.5.1. When a need for in person meetings occurs, they will take place in a designated outdoor location while maintaining six feet of distance, and wearing protective face coverings.

3.3.5.2. In the event of inclement weather or the outdoor meeting space being unavailable, an indoor, well ventilated meeting space has been prepared both at the hotel in Adelaide and at the airport. Social distancing protocols will be implemented in these meeting spaces, with desks and tables a minimum of six feet apart and floor markings put into place.

3.3.6. All 25-30 essential personnel deployed to Adelaide will be encouraged to *shelter-in-place* while deployed. In this context, *shelter-in-place* is defined as only leaving your accommodations for work or for *essential activities*, which are defined by the prevailing local public health orders <https://www.covid-19.sa.gov.au/restrictions-and-responsibilities>. In addition, all personnel will be restricted to utilizing single-occupancy accommodations while deployed.

3.3.7. All personnel deployed will be advised to book and utilize their own rental car (or within their bubbles) for the purposes of personal transportation.

3.3.7.1. Carpooling will be kept to only those who are within the same bubble and only carpool with the same people. Carpoolers will:

- Wear a mask while in the car
- Clean and disinfect surfaces frequently
- Use proper hand hygiene
- Maximize air circulation while in the car (windows and vents)
- Maintain distancing whenever possible
- Cover coughs and sneezes

3.3.7.2. Use of taxis and ride sharing services (e.g., Uber, Lyft) will not be permitted

3.3.8. No mission related local public events will occur at LaRC, JSC, or Australia. No aircraft or facilities used by the mission will be open to visitors or for tours. In addition, **no general public events** with mission personnel will be scheduled or organized. **This does not include visits to the aircraft by high ranking government figures in Adelaide. If this were to happen, the event will occur outdoors and observing 6ft physical separation at all times.** Signs will be posted noting that access to facilities will be restricted to mission personnel. Virtual events guided by the PI team will be allowed.

3.3.9. No communal dining areas will be set up for use during deployment. Communal use of refrigerators, microwaves, coffee makers, water coolers, etc. will be discouraged.

Project personnel will be permitted to bring in single serve water bottles and snacks. Any food brought on site should be for personal consumption only.

3.3.10. Where necessary, ESPO will post signs, tape marks, or other visual cues such as decals or colored tape on the floor, placed 6 feet apart, to indicate proper social distancing where appropriate.

3.4. Personal Protective Equipment (PPE)²

3.4.1. While on deployment in Australia, all personnel will be required to wear facial coverings (cloth masks or non-sterile disposable masks) as appropriate based on the local conditions and regulations. Currently, as of October 22nd, 2020, facial coverings are not required in Adelaide and the South Australia territory with the exception of the airport facilities. Should the local regulations change, SHARC personnel will immediately abide by these rules. SHARC personnel opting to wear a facial covering regardless of the local conditions may do so.

Personnel will be instructed to provide their own facial coverings, but ESPO will have an available backup supply.

- In addition to face coverings, those participants working onsite at the Adelaide International Airport will wear gloves at all times.

3.4.2. SHARC participants transiting or operating onboard the JSC G-III or the LaRC G-III aircraft will adhere to the PPE on-aircraft rules of JSC and LaRC respectively when transiting and working onboard these aircraft in Adelaide. When off aircraft in Adelaide, the rules outlined in this Safety Plan will apply (note Exception 2 above in Section 2.1).

3.4.3. ESPO already has a stock of the following PPE and cleaning supplies³ and will be transporting this stock to have available on-site in Australia:

- disposable dust masks
- KN95 masks
- hygiene supplies (Hand sanitizer (alcohol 60%+) , antibacterial soap, paper towels, no-touch trash receptacles, tissues, etc.)
- EPA-approved³ disinfectant wipes or spray such as
 - Clorox Clean up disinfecting cleaner with Bleach, EPA registration number 67619-17
 - Clorox disinfecting wipes with micro-scrubbers, EPA reg. No. 5813-79
 - Clorox Anywhere Hard Surface Sanitizing Spray, EPA reg. No. 67619-14
- non-sterile nitrile gloves (for cleaning surfaces)
- face shields (if requested in advance)
- safety goggles (if requested in advance)

Personnel will dispose of PPE appropriately by throwing it into the correct disposal bin.

² PPE requirements at mission participants' home institutions or at NASA centers supporting instrument integration will be governed by the respective institutional or centerwide policies.

³ A list of EPA-approved disinfectants for use against COVID-19 can be found at <https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>

3.5. Cleaning/Hygiene Protocols⁴

3.5.1. ESPO -as necessary- will augment any additional janitorial services or organization of common areas that may be required for safe operations while on deployment. ESPO will ensure that there is increased and enhanced cleaning of commonly touched surfaces, appropriate signage, availability of PPE, etc.

3.5.1.1. Surfaces frequently touched by multiple people, such as door handles, desks, phones, light switches, and faucets, will be cleaned and disinfected at least daily. More frequent cleaning and disinfection may be required based on level of use.

3.5.1.2. ESPO will supplement this protocol with additional cleaning measures as necessary based on the level of use. All mission personnel will be supplied with the PPE and cleaning supplies listed in Section 3.4.4 to aid in the cleaning of their personal property and work spaces.

3.5.1.3. If not already provided by the hotel or by the airport management at the Adelaide airport, ESPO will provide hand sanitizer at entryways, outside of bathrooms, and in close proximity to work spaces.

3.5.2. All personnel will be reminded to wash their hands frequently with soap and warm water for at least 20 seconds, especially after being in a public place or after eating, using the restroom, blowing their nose, coughing, or sneezing⁵. If soap and water are not readily available, deployed personnel should use a hand sanitizer that contains at least 60% alcohol. ESPO will ensure the deployment site is well stocked with liquid hand soap, hand sanitizer, and paper towels.

3.5.3. ESPO -as necessary- will post signs and posters reminding people to frequently wash their hands and to practice good hygiene as recommended by the CDC⁶ and to dispose of used PPE appropriately in regular garbage bins to avoid personnel from handling other people's PPE.

3.6. Communication and COVID-19 Emergency Preparedness/Response

3.6.1. ESPO will provide all mission participants with this Safety Plan and a Mission Deployment Guide. Additionally:

3.6.1.1. Each mission participant will be provided information on what to do if they get sick. Reference Appendix C – COVID-19 Emergency Response Plan.

⁴ Cleaning/hygiene protocols at mission participants' home institutions or at NASA centers supporting instrument integration will be governed by the respective institutional or centerwide policies.

⁵ <https://www.cdc.gov/handwashing/when-how-handwashing.html>

⁶ <https://www.cdc.gov/handwashing/materials.html>

3.6.1.2. Mission participants who begin to feel sick on site or off duty while on deployment will follow Appendix C – COVID-19 Emergency Response Plan.

3.6.1.3. Each mission participant will be provided information on what to do if other team members get sick or if they believe they have been exposed to someone who has Covid-19. Reference Appendix C – COVID-19 Emergency Response Plan.

3.6.1.4. Each mission participant deployed will be provided information on how to communicate concerns and issues while on deployment.

3.6.1.5. Mission participants will be encouraged to keep track of their in person interactions and activities both inside and outside of work, in case it becomes necessary to provide this information to local health authorities for contact tracing purposes.

3.6.2. Flight crew and QNCs who begin to feel sick while in-flight will follow the rules from each respective flight center.

3.6.3. Mission participants who have knowledge of recent close contact with another person who is sick or has a confirmed case of COVID-19 while deployed will notify ESPO management, the Mission Project Manager, and their supervisor immediately and remain in their accommodations while waiting for further instructions.

3.6.4. ESPO will monitor the guidance from all local public health offices whose jurisdictions cover LaRC, JSC, and Adelaide, Australia and alert mission participants to any changes in guidance.

3.6.5. ESPO will disseminate a Plan of the Day, which will include any necessary updates regarding COVID-19, site access, local restrictions, etc.

3.7. Training / Informing Mission Participants

3.7.1. ESPO will give several pre-mission safety briefings to all SHARC mission participants deploying to Adelaide, both civil servants and contractors. These briefings include:

- Instructions covering the topics in Section 3.6 and Appendixes B and C of this plan as described (e.g. what to do if you start to feel ill, what to do if a teammate starts to feel ill, etc.)
- social distancing while deployed
- training on proper use of PPE
- disinfecting of high-touch areas on their equipment
- hand washing

3.7.2. Mission participants will adhere to any other COVID-19 training required by their respective Centers and/or home organizations.

3.7.3. ESPO will draft and disseminate a written safety orientation briefing approximately one month prior to mission start regarding the COVID-19 protective measures and mitigations discussed in this plan (e.g., social distancing, proper use of PPE, disinfecting high-touch areas, handwashing, etc.) with particular emphasis on the measures **that will be the individual responsibility of all deployed personnel** (e.g., **STAY IN YOUR HOTEL ROOM** if you start to feel ill, what to do if a teammate starts to feel ill, etc.). In addition, a virtual all-hands safety briefing will be conducted approximately two weeks prior to mission start that will cover and reinforce all key rules and regulations. **Attendance for this briefing will be mandatory.**

3.7.4. ESPO will make sure that all mission participants will also receive any additional safety plans and information from other centers when applicable (e.g. SHARC personnel participating in the integrations at JSC and LaRC will be given all appropriate materials for those centers).

3.8. Facilities

3.8.1. ESPO and respective aircraft mission managers will contact center management to ensure that HVAC and potable water systems are in working order at each integration and deployment location prior to RTOW.

3.8.2. In Australia, ESPO will verify that the mission facilities to be used by mission participants (hotel and airport facilities) are adequately set up to implement the safety measures outlined in this document and provide a safe work environment.

3.9. Hotels (Mandatory Quarantine and Deployment)

3.9.1. Upon arriving at their point of entry SHARC participants will undergo a mandatory 14-day quarantine at an assigned Medi-hotel in Australia.

3.9.1.1. Personnel do not get to choose where to quarantine, their hotel/room will be assigned, upon arrival, by the Australian Government at their point of entry. Personnel will notify ESPO management of their arrival and medi-hotel location.

3.9.1.2. Personnel may be tested for Covid-19 within the first 48 hours of quarantine and/or between days 10-12 of quarantine. Exact testing arrangements will depend on the state in which the participant is being quarantined and as determined by the Australian Health authorities.

<https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/coronavirus-covid-19-restrictions/coronavirus-covid-19-advice-for-international-travellers>

3.9.1.3. Personnel will be strictly limited to their rooms during the 14-day quarantine and food will be provided and brought to them in a contactless manner, while in quarantine. The Australian government has a flat fee of \$3,000AUD (\$2,216USD) to cover the quarantine costs, including the meals. Any special meals or accommodations can be requested at additional costs.

3.9.2. In Australia, after the quarantine has ended, SHARC personnel will relocate to the hotel selected for the mission, ***The InterContinental Hotel***, located at: North Terrace ADELAIDE, SA 5000. This hotel has implemented a COVID-19 safety plan in conjunction with Ecolab. *The hotel uses hospital grade cleaning materials, social distancing measures, hand sanitizing stations, contactless payment options, enhanced food safety standards, and access to a network of tele-doctors for guests, among other services.*

Appendix A. Further Information on Social Distancing Protocols

A.1. Workspace Layout

1. In-person gatherings/meetings will be discouraged during the deployment. In the rare event where an in-person meeting might become absolutely necessary we have available a meeting room in the hotel measuring 6m x 8m (20.25ft x 27ft). No more than 10 people will be allowed in that space to allow for implementation of social distancing measures that include 1.8m / 6ft of physical separation, wearing masks, and no physical contact.
2. As mentioned in Sec. 3.3 above, personnel will limit their time in the workspace to activities that can only be achieved in that venue. These activities are generally limited to activities that might demand in person communications such as pre-flight activities, flight control operations, and post-flight data processing. Pre-flight and post-flight briefings, which would typically occur in a conference room, will either be held remotely in the safety of each individual's hotel room, in the hangar (if one is available) w/ the hangar door open, or outdoors. Always maintaining physical distance.
3. Flight operations will rely on the concept of compartmentalization of personnel to minimize the risk of a COVID-19 outbreak. It will be necessary for air crew and instrument operators of each of the two aircraft to be together inside an aircraft cabin for many hours for a research flight⁷. However, the risk of COVID-19 spread is reduced by the fact that the personnel required for each aircraft will not interact with personnel from other aircraft while deployed and will stay within their own "social bubbles".

⁷ See the JSC and LaRC flight safety plans for precautions and mitigations that will be employed during flight.

Appendix B. Further Information on Cleaning Protocols⁸

B.1. General Cleaning Guidelines

1. Cleaning is everyone's responsibility. Employees need to clean areas they come in contact with, especially if they handle equipment shared with other employees.
2. Clean all frequently touched surfaces in the workplace, such as workstations, countertops, doorknobs, phones, and tools. Other areas in or around offices include: telephones, arm rests of chairs, light switches (under cabinet and wall), door handles, curtains/blinds, printer/copier touchpads and lids, projector controls, whiteboard markers and erasers.
 - a. For mission operations centers –wipe down all hand-touch surfaces on shared equipment after use.
 - b. For conference rooms - meeting hosts will clean conference tables and hard surfaces such as chair armrests before and at the conclusion of each meeting.
 - c. Do not drink directly from water fountains. Instead, sanitize your hands, and then fill personal containers using water fountains.
3. Use the cleaning agents that are supplied or approved by the center in these areas and follow the directions on the label.
4. Apply spray disinfectants directly on wipes, not directly on electronic equipment or phones.
5. Personnel will dispose of PPE appropriately by throwing it into the correct disposal bin.
6. Care must be taken when cleaning screens of any kind, for example, computers, telephones and pads. Only follow manufacturers' recommendations for how and what to use to clean screens, they may be sensitive to some chemicals

B.2. Cleaning a Private Workspace

1. Disinfect all surfaces upon arriving for the day, like your desk, chair, phone, keyboard, mouse, pointer, writing utensils and touch screens, if you can.
2. Only use cleaning products supplied or approved by your center.
3. Follow manufacturer's guidance for cleaning and, if no guidance is provided, use wipes or sprays effective against the Covid-19 virus.
4. Do not mix your own cleaning products and bring them to your NASA worksite.
5. Read cleaning labels and directions before use.
6. Unplug electronic devices before cleaning.
7. Avoid spraying electronics or keyboards directly with cleaning supplies.
8. Consider removing unneeded items from your workspace to reduce handling or contact from multiple people.
9. Continue to disinfect your workspace regularly throughout the day.

⁸ From the ARC COVID-19 Health and Safety Guidance for Employees Returning to On-Site Work, Rev 3 <https://insideames.arc.nasa.gov/wp-content/uploads/COVID-19-Health-and-Safety-Guidance-for-Employees-Returning-to-On-Site-Work.pdf?x91390>

B.3. Cleaning a Shared Workspace

1. Avoid using other employees' office equipment, including phones, desks, chairs, writing utensils, keyboards, mouse pointers, etc.
2. Clean and disinfect other employees' office equipment before and after use, if you must use it.
3. Disinfect all spaces, including desks, counters, shared tools and shared equipment regularly throughout the day.
4. Avoid holding in-person meetings and instead opt for virtual meetings.
5. Disinfect conference tables, chairs, remote controls, writing utensils, light switches and shared electronics, if you must meet in person.
6. Maintain at least 6 feet of distance between yourself and others and continue wearing cloth facial coverings throughout any face-to-face meetings.

B.4. Enhanced Cleaning

1. The selected hotel has an ALLSAFE rating. This rating (used by world class hotel brands around the world such as Sofitel, Fairmont, Novotel, and many others) implements strict cleanliness and infection prevention guidelines in hotels. These measures include:
 - a. Personnel trained in comprehensive safety and hygiene procedures
 - b. Reinforced cleaning programs with frequent disinfection of all high-touch areas like elevators and public restrooms.
 - c. Standard enhanced in room cleaning using hospital grade cleaning materials.
 - d. Regular deep cleaning of upholstery and carpets. Bedding washed and treated at high temperatures.
 - e. Restaurants, bars and seating in public areas comply with government specified distancing measures.
 - f. Guests are provided with individual sanitizer, wipes, and masks.
 - g. Guest temperature measurements practices
 - h. Disinfectant mats at hotel entrance and partitions at front desks to provide protection for guests and hotel staff.
 - i. Contactless payment solutions and desk-free check-in
 - j. Guest access to AXA medical network for teleconsultations with medical care providers.
 - k. Enhanced Covid-19 food safety standards for food preparation and public dining
2. Another building that will be utilized, but much less frequently and only prior to and after the flight, is the Cobham Fixed Base Operator (FBO) building at the Adelaide International airport. Cobham FBO is also implementing enhanced and strict measures such as personnel pre-screening, frequent cleaning with hospital grade disinfectants of high touch surfaces and high transit areas such as:
 - Entrance doors to all buildings occupied by mission participants

- Handrails on stairs
- Elevators
- Waiting rooms
- Rest rooms

Appendix C. COVID-19 Emergency Response Plan

This guidance has been developed in order to conduct the SHARC mission with the highest level of regard to the safety of the participants. However, despite the development and implementation of measures to mitigate the risk of COVID-19 infection, the risk still exists.

C.1. COVID-19 Symptoms

The following symptoms may appear 2-14 days after exposure⁹:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea

C.2. Sickness or Confirmed COVID-19 Test Prior to Travel

Starting 14 days prior to the start of operations at the NASA Centers and/or travel to Australia, all primary and alternate mission participants will conduct daily health self-assessments. If a participant begins to feel ill prior to traveling to either the integration or deployment sites, then the participant will take the following steps:

- Stay at home and self-isolate
- Seek medical guidance from their personal physician
- Notify their supervisor and the mission project manager, and ESPO management

If the participant tests positive for COVID-19, then the previously identified back-up team member will deploy instead, provided there has been no close contact with the ill participant or with anyone else who has been diagnosed with COVID-19. To the greatest extent possible, a “bubble” strategy will be utilized to minimize the risk of spread between primary participants and back-up participants.

⁹ <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>

C.3. Sickness or Confirmed COVID-19 Test During Integration and Deployment

1. Off-Duty (Integration and Deployment Activities)

If a participant first begins to experience symptoms while off duty at the deployment site, then the participant will take the following steps:

- Do not report to work on-site and self-isolate
- Seek medical guidance for immediate action. In Australia, travelers have the option of using the tele-doctor network consultation provided by the hotel or consult directly with their personal physicians. The availability of tele-consultation is especially important given the time difference between Australia and the United States.
- Notify ESPO Management, the Mission Project Manager, and their supervisor. The ESPO Management and the Mission Project Manager will then notify line management and the respective center's Medical Directors

2. While at Work (Integration and Deployment Activities)

If a participant starts to feel ill while at work, the participant will take the following steps:

- Immediately leave the work site and go back to the hotel to self-isolate
- Seek medical guidance for immediate action. In Australia, travelers have the option of using the tele-doctor network consultation provided by the hotel or consult directly with their personal physicians. The availability of tele-consultation is especially important given the time difference between Australia and the United States.
- Notify ESPO Management, the Mission Project Manager, and their supervisor. The ESPO Management and the Mission Project Manager will then notify line management and the respective center's Medical Directors

To summarize, there is no decision to be made by any center health unit regarding the health or the treatment of a person traveling. That decision is made by the traveler in consultation with their personal care provider, any available care on site (such as the tele-doctor or a local physician or hospital). Those primary caregivers will dictate the diagnosis and treatment required, not just for COVID but also for any other illness. In the case of a person with a positive COVID-19 case, such person would not be allowed to travel (in Australia or anywhere in the world). He/she would be sent to self-quarantine (or treatment if needed) and only allowed to resume travel after medically cleared to do so. The mission management/ESPO will keep the various NASA centers' health units informed of any confirmed COVID-19 cases.

3. COVID-19 Testing Locations

If after consultation with their personal physician, it is determined that the participant should be tested for COVID-19, the participant will get tested as soon as possible.

In the US, mission personnel will coordinate with their respective health insurance providers regarding testing. In Australia, testing must be coordinated via a General Practitioner (GP). Further instructions on how to proceed will be obtained via the tele-medicine process in place at the hotel and the local health facilities. ESPO will have the most up to date information regarding COVID-19 testing sites and hospitals in Adelaide as part of their Mission Deployment Guide.

4. While Waiting for Test Results

While waiting for COVID-19 test results, the mission participant, as well as anyone who has been in close contact with the suspected infected person, will follow the guidance found at <https://www.covid-19.sa.gov.au/health-advice/self-isolation-and-quarantine> while isolating themselves from other mission participants. The Principal Investigator and Project Manager will inform and act on the advice of the respective center's Medical Director, and in consultation with ARC, LaRC, JSC and the US embassy in Australia, with regard to continuing mission operations.

5. In the Event of a Confirmed COVID-19 Case During Deployment

Mission Participant with Confirmed Case

If a participant has a confirmed case of COVID-19, then the participant will take the following steps:

- Put on a mask and avoid contact with others until obtaining further direction from their health care provider
- Follow the guidelines above.
- Contact their predetermined health facility, arrange for a telehealth consultation and further instructions.
- Travel of personnel with a positive COVID-19 diagnosis (symptomatic or asymptomatic) is not permitted. The personnel will self-quarantine in their current location until a Negative result is obtained.
- Notify ESPO Management, the Mission Project Manager, and their supervisor. The ESPO Management and the Mission Project Manager will then notify line management and the respective center's Medical Directors

6. Contact Tracing

If the participant tests positive for COVID-19, or if the respective center's Health and Safety Office determines it is advisable, then the participant will need to produce a list of individuals with whom they were within 1.8 m (6 ft) for longer than six minutes and locations visited in the three days prior to experiencing symptoms. Mission participants will be advised to maintain a log of contacts who meet this criteria. This information will be provided to the respective center's Health Unit for contact tracing purposes. In this

scenario, the mission will be following Ames and CDC guidance, which is stricter than the guidance laid out by the Communicable Diseases network Australia (CDNA)¹⁰.

C.4. Sickness or Confirmed COVID-19 while in Transit

1. Participants flying Commercial

If a participant falls ill while flying commercial to Adelaide, Australia, the passenger will follow the air carrier's recommendations and procedures until they land. The participant will then work with local authorities and seek guidance from their personal medical provider where they land. The participant will notify ESPO Management, Project Management, and their supervisor as soon as possible and provide status updates throughout their medical emergency. ESPO Management and Project Management will notify line management and the respective Medical Directors as the emergency unfolds.

2. Participants flying on a NASA aircraft

If a passenger or crew member on the G-III 520NA or the G-III 922NA becomes sick while in transit to Australia, that aircraft's home center safety plan, as well as the local rules of the aircraft's location will apply.

3. During the 14 day quarantine in Australia

If a participant falls ill or tests positive for COVID-19 the participant will follow the local rules and regulations and contact their personal medical provider to seek further guidance or assistance. The participant will also immediately notify their supervisor, ESPO management, and Project management, and provide updates. ESPO Management and Project Management will notify line management and the respective Medical Directors as the emergency unfolds.

The current policy for quarantine, isolation, and release from isolation if a participant tests positive for COVID-19 may be found here: <https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/how-to-protect-yourself-and-others-from-coronavirus-covid-19/isolation-for-coronavirus-covid-19>

Appendix D. Miscellaneous

D.1. Prerequisites for Safe Return to Deployment/On-site Work

All deployment operations happen outside of NASA Ames Research Center. The ESPO team in Adelaide will ensure that the following have been verified before the start of the SHARC deployment:

¹⁰ Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units reference: [https://www1.health.gov.au/internet/main/publishing.nsf/Content/7A8654A8CB144F5FCA2584F8001F91E2/\\$File/COVID-19-SoNG-v3.8.pdf](https://www1.health.gov.au/internet/main/publishing.nsf/Content/7A8654A8CB144F5FCA2584F8001F91E2/$File/COVID-19-SoNG-v3.8.pdf)

- Availability of an adequate supply of COVID-19 PPE specified in the plan
- Proper functioning of HVAC systems
- Completion of COVID-19 and Safety Plan briefing to all returning employees
- Final walkthrough by ESPO to ensure facilities in Adelaide are in compliance with Safety Plan requirements

D.2. Nominal Work Day Schedule

- T-3h: Weather brief update, flight planning brief (virtual at hotel)
- T-2h: Instrument teams and aircraft crew arrive at Adelaide International Airport, prepare instruments/aircraft for flight operations.
- T-1h: Flight crew arrives, final preparations
- T-0: Aircraft take-off
- T+4h: Aircraft land, post flight operations (instrument and aircraft)
- T+4.5h: Personnel returns to hotel

D.3. NASA Ames Research Center Personnel Contract Details

Company	# of Personnel	ARC Code	Contract name	Contract Number
BAERI	3	SG	ARC-CREST	NNX12AD05A
USRA	1	SG	NASA ACADEMIC MISSION SERVICES	NNA16BD14C

D.4. NASA Ames Research Center Mission Participants

Primary Personnel (Employer)	Mission Role
Jhony Zavaleta (NASA)	Mission Support Project Manager
Caitlin Murphy (BAERI)	Mission Support Project Coordinator
Jay Grinstead (ARC NASA)	Mission Principal Investigator
Potential Deployment to LaRC/JSC:	
Dave Van Gilst (BAERI)	Instrument Integration- Satellite Communications
Carl Sorenson (USRA)	Instrument Integration- Satellite Communications
Alternate Deployment Personnel	
Quincy Allison (BAERI)	Mission Support Deputy Project Manager/ Shipping Lead

D.5. NASA Glenn Research Center Mission Participants

Primary Personnel (Employer)	Mission Role
Kurt Blankenship (NASA GRC)	JSC G-III Back-up Pilot

D.6. NASA Johnson Space Center Mission Participants

The exact back-ups will be determined upon further inspection of need, closer to the deployment dates.

Primary Personnel (Employer)	Mission Role
Ehrenstrom, William Allen	Pilot / Mission Commander
Fuller, David	Aircraft Mechanic
Gunderson, Katelyn Elizabeth	Flight Science Officer / Engineer
Scott, Johnny	Aircraft Mechanic

Alternate Personnel (Employer)	Mission Role
Brown, Michael	Aircraft Mechanic
Damazio, Ricky	Aircraft Mechanic
Elliott, David	Flight Science Officer
Henriquez, Carlos	Aircraft Mechanic
Kingery, Trent	Pilot / Project Pilot
Newton, Jeremy	Pilot / Deputy Project Pilot
Thompson, Tyler Clement	Deputy Project Manager, ASP
Valle, Luis	Aircraft Mechanic
Vazquez, Angel	Aircraft Mechanic
Fennell, James	Aircraft Mechanic

D.7. NASA Langley Research Center Mission Participants

The exact back-ups will be determined upon further inspection of need, closer to the deployment dates.

Primary Personnel (Employer)	Mission Role
Bombaro Jr., John Anthony	Aircraft Mechanic
Cissel, Ken	Aircraft Mechanic
Elder, Matthew G	Research Pilot

Shelton, Kevin John	Flight Engineer
Thorson, Taylor	Research Pilot
White, Robert Thomas	Aircraft Mechanic
Conn, Robert Arthur	Data Manager
Inman, Jennifer A.	Mission Manager
Scott Jr., Carey Fulton	Mission Systems Engineer

Alternate Personnel (Employer)	Mission Role
Coldsnow, Matthew W.	Research Pilot
Mielnik Jr., John Joseph	Aircraft Mechanic
Beard, Ronald	Logistics Coordinator
Boyda, Matthew Thomas	Data Manager
Grinstead, Jay Henderson	Principal Investigator
Horvath, Thomas John	Principal Investigator

D.8. JAXA Mission Participants

Primary Personnel (Employer)	Mission Role
Shinsuke Abe (Nihon University)	Planetary Scientist, Secondary Spectroscopy Instrument
Kazu Fujita (JAXA)	Engineer (aerothermal/TPS)

Alternate Personnel (Employer)	Mission Role
Satoru Nakazawa (JAXA)	Deputy Project Manager, Institute of Space and Astronautical Science (ISAS)
Tetsuya Yamada (JAXA)	Primary JAXA Liaison, Engineer (SRC)
Hideyuki Tanno (JAXA)	Engineer (Hypersonics/aerothermal/instrumentation)

D.9. MARS Scientific (NASA Contractors) Mission Participants

Primary Personnel (Employer)	Mission Role
Dantowitz, Ronald Franklin	Science Lead
Hudson, David William	Sensor Operator
Lockwood, Christian A	Sensor Operator
Lula, Brian	Gimbal operator
Karavas, Yiannis	Gimbal operator
Scott, James	Gimbal operator
Legato, Michael	Sensor Operator
Hoover, Zev	Team Lead
von Riesen, Richard	Program Manager
Johnson, Brent	Ground support/Flight backup
Zimmermann, David	Ground support
Sanchez, Joseph	Ground support/Flight backup
O'Connor, Robert	Ground support/Flight backup

Alternate Personnel (Employer)	Mission Role
Newman, Nickolas	Ground support/Flight backup

Appendix E. Mission Critical Letter

National Aeronautics and
Space Administration

Headquarters
Washington, DC 20546-0001



Reply to Attn of: SMD/Planetary Science Division

TO: Director, Johnson Space Center
Director, Langley Research Center
Director, Ames Research Center
Director, Armstrong Flight Research Center

FROM: Director, Planetary Science Division, Science Mission Directorate

SUBJECT: Mission Critical Designation of Hayabusa 2 Observation Campaign

The Planetary Science Division (PSD) of the NASA Headquarters Science Mission Directorate (SMD) hereby classifies the Hayabusa2 asteroid Sample Return Capsule (SRC) Observation Campaign, to be performed by the NASA Scientifically Calibrated In-Flight Imagery (SCIFLI) team, as a mission critical project that cannot be completed through telework and/or other virtual means.

The Hayabusa2 SRC Earth atmospheric entry is a one-time event that will occur on December 6, 2020. NASA aircraft observations of the SRC entry are an integral component of a larger international collaboration between the National Aeronautics and Space Administration (NASA) and the Japan Aerospace Exploration Agency (JAXA) in accordance with a Memorandum of Understanding (MOU) between the two organizations. This MOU extends back to previous missions (e.g. Hayabusa / MUSES-C in 2010) and forward to future returned samples (OSIRIS-REx: Origins, Spectral Interpretation, Resource Identification, Security-Regolith Explorer, sample return in 2023). Fulfillment of the overall MOU provides NASA access to the asteroid samples returned by the Hayabusa2 SRC. SMD leadership encourages a mission critical designation from each participating NASA Center, as required, provided appropriate safety procedures are implemented to reduce the risks of participants contracting or spreading the SARS-CoV-2 virus.

The Hayabusa2 observation campaign, utilizing two NASA Gulfstream III aircraft, seeks to acquire spectroscopic and trajectory reconstruction data during the SRC return to Earth on the RAAF (Royal Australian Air Force) Woomera Range Complex in Australia on 6 December 2020.

The datasets derived from the calibrated imagery collected during this “one shot” reentry opportunity support the Science Mission Directorate’s Planetary Science Division and the Space Technology Mission Directorate’s Entry Systems Modeling (ESM) project by providing unique and unprecedented flight measurements associated with the high energy physics of atmospheric entry from superorbital return velocities. Spectral emissions from the capsule’s thermal protection system (TPS) surfaces and the surrounding plasma environment will provide verification data to more confidently and cost-effectively enable future missions to destinations within our solar system.

In order to complete preparations for deployment in mid-November 2020, aircraft preparation / modification / maintenance and instrument integration activities will be required to be conducted at various NASA Centers, beginning immediately. COVID-19 impacts to the project have already required transitioning from the NASA DC-8 aircraft platform to two Gulfstream III aircraft, largely consuming the project’s schedule margins. Further delays will jeopardize the SCIFLI team’s ability to integrate the NASA and JAXA instruments, obtain the necessary travel documents, and forward deploy to Australia with sufficient time to accommodate international quarantine restrictions.

If the SCIFLI Principal Investigator and Project Manager agree to conduct the observation, then PSD supports that decision, provided all NASA Center and partner institutions also agree and all participants follow applicable policies and appropriate safety procedures.

LORI GLAZE Digitally signed by LORI
GLAZE
Date: 2020.08.09
12:41:38 -04'00'

Lori S. Glaze, Ph.D.
Director, Planetary Science Division
NASA Headquarters

cc:
SMD/Mayra Montrose
ESD/Karen St. Germain
PSD/Anthony Carro
PSD/Joan Salute
ESD/Bruce Tagg
ARC/Jay Grinstead
LaRC/Thomas Horvath
LaRC/Jennifer Inman
LaRC/Carey Scott
ARC/Jhony Zavaleta

Appendix F. Acronym List

AFRC	Armstrong Flight Research Center
ARC	Ames Research Center
ASF	Airborne Science Facility
BAERI	Bay Area Environmental Research Institute
CDC	Center for Disease Control
CDNA	Communicable Diseases Network Australia
CST	Combined Systems Test
EPA	Environmental Protection Agency
ESD	Earth Science Division
EMS	Entry Modeling System
ESPO	Earth Science Project Office
FBO	Fixed Base Operator
G-III	Gulfstream III
HQ	Headquarters
HVAC	Heating, Ventilation, and Air Conditioning
IT	Information Technology
JAXA	Japan Aerospace Exploration Agency
JSC	Johnson Space Center
LaRC	Langley Research Center
NAMS	NASA Access Management System
NASA	National Aeronautics and Space Administration
PI	Principal Investigator
PM	Project Manager
PPE	Personal Protective Equipment

QNC	Qualified Non-Crew
RAAF	Royal Australian Air Force
RTOW	Return To On-site Work
SCIFLI	Scientifically Calibrated In-FLight Imagery
SHARC	SCIFLI Hayabusa2 Airborne Re-entry Observation Campaign
SRC	Sample Return Capsule
TPS	Thermal Protection System
USRA	Universities Space Research Association