

**Soyuz Contingency Landing
Technical Interchange Meeting
6 – 15 December 2000
NASA/Houston Texas
FINAL PROTOCOL**

I. Attendees:

NASA/JSC

R. Pocklington
J. Hirasaki
J. Curry
H. Peters
L. Eyharts
S. Johnston
A. Sargsyan
M. Chandler
O. Novinkov
W. Seay
R. Silvestri
D. Bellue
M. Linde
C. Cerimele

RSC-Energia

V. Timchenko
V. Guzenko
E. Utkin
R. Ashimov
A. Alexandrov
V. Lushiskiy

Rosaviakosmos

V. Buks

FPSU

V. Pronin

GCTC

N. Grekov

NASA/BOEING – KSC

G. Snyder
G. Fooks
R. Galke
M. Lee
J. Rogers

IBMP

I. Gontcharov

NASA/Headquarters

R. Davis

DDMS

R. McCallister

AFRCC

K. Schumann

Interpreters

J. Moiseyev
S. Veysbeyn
Y. Profilet

II. Discussion

The participants listed on the previous page met during this Mini-TIM to continue discussions and develop procedures and review proposed checklists for all aspects of a Soyuz contingency landing in the United States and addressed the following major topics and procedures:

- NASA support for a landing inside and outside the United States
 - Air Force Rescue Coordination Center Faxable Checklists
 - DOD interface, procedures and capabilities
 - Medical Operations coordination and Faxable Checklists
 - KSC proposed procedures for vehicle processing support
 - Development of a JOIP Procedure that establishes a notification timeline and organizational responsibilities
 - MCC-M and MCC-H Interactions
 - Coordination for Russian landing response aircraft
 - Discussions on Ballistic and Controlled Entry to North America
 - A review of North American landing areas and possible controlled entry areas
 - Exchange of Form 14 information
 - Program level review of proposed procedures and required agreements
1. NASA regards existing bilateral and multilateral agreements—including the Convention on Liability for Damage Caused by Space Objects; the Agreement on the Rescue and Return of Astronauts; the Return of Astronauts, and the Return of Objects Launched into Outer Space; the Agreement Among the Government of Canada, Governments of the Member States of the European Space Agency, the Government of Japan, The Government of the Russian Federation, and the Government of the United States of America Concerning Cooperation on the Civil International Space Station; and the Memorandum of Understanding between the National Aeronautics and Space Administration (NASA) of the United States of America and the Russian Space Agency (Rosaviakosmos) Concerning Cooperation on the Civil International Space Station—as sufficient to define responsibility and liability associated with the landing and return of the Soyuz Vehicle. According to the existing agreements, the Soyuz vehicle, and crew return through “assembly complete,” are Russian responsibilities. The Russian Delegation pointed out that the existing MOU, the agreements regarding the ISS, and multilateral space regime do not address ISS associated contingency landings. Technical discussions at this TIM suggest that the existing agreements should be reviewed at the Agency level to account for these contingencies. This should be accomplished in a separate and appropriate agreement or MOU.
 2. NASA is willing to provide the following support for Search and Rescue to insure the safety of the crew:
 - Coordination of United States Search and Rescue through the AFRCC.
 - Facilitation of Search and Rescue for a landing outside the United States.
 - Expedited Visa and Aircraft Clearance Procedures for the Russian Vehicle Processing Team in the United States.
 - Coordination with Customs for exemption of the Vehicle and identified crew emergency kits and processing equipment in the United States.

3. The participants of the meeting have developed an overall plan. This document defines the notification flow; estimated timeline; and agency interactions, responsibilities and procedures for a Soyuz contingency landing. This plan will be used in developing the JOIP (Attachment A). It also includes the MCC-M and MCC-H interactions, tasks and responsibilities during rescue operations of the Soyuz transport vehicle crew in the event of an emergency descent in North America. All parties will use this document in defining operations.
4. The Air Force Rescue Coordination Center provided drafts of their checklists that will be faxed to federal, state and local authorities to detail the required procedures for Soyuz Search and Rescue and safe evacuation of the crew. These checklists were updated during the meeting and are provided in Attachment B and are part of the overall plan. Discussions between AFRCC, DDMS and the Russian Federal Search and Rescue Department established the following guidelines:

Until the arrival of the Russian real-time technical support group, the United States will bear responsibility for the safe execution of search and rescue operations within the Continental United States

Guided by the principles of flight safety, the representatives of AFRCC, DDMS, and the Russian Federal Search and Rescue Department deem it necessary for continuing dialogue through conferences, consultations, hands-on lessons and exchanges of experience on conducting search and rescue operations with search and rescue experts from checklists the U. S. and the Russian Federation, as required.

AFRCC, DDMS and Federal Search and Rescue Agency (RU) are prepared to participate as consultants in work on agreements, MOUs and protocols related to search and rescue operations.

5. The Medical Operations Teams have produced a faxable checklist for Soyuz TM and TMA Crew Extraction and Medical Support at a Contingency Landing. This checklist, medical agreements, Cosmonaut operational readiness levels after a contingency landing and an estimated timeline are included as Attachment C and are part of the overall plan.
6. Pending Program approval, KSC has established ground rules, assumptions and procedures for implementation of operations providing security, logistic support and coordination for the Russian processing team that will return the Soyuz Vehicle to Russia following a contingency landing in the United States. These ground rules follow the outline proposed in Response Option 1 of the previous protocol, since NASA deemed Option 2 unacceptable at this time. These ground rules, assumptions, and procedures are provided as Attachment D and are part of the overall plan. RSC-Energia advised that in order to equip the team that would process the Soyuz vehicle following a landing in North America, they must fabricate an additional set of tools and equipment. RSC-Energia proposes that NASA pay these costs.

7. MCC-M and MCC-H have developed basic guidelines that define tasks and responsibilities during rescue operations of the Soyuz transport vehicle crew in the event of an emergency descent on the North American territory. This document is provided as Attachment E and is part of the overall plan.
8. Basic guidelines for the Russian Federal Search and Rescue Department tasks and responsibilities when performing rescue operations on U. S. territory and the sequence of interactions for operation participants have been developed. This document is provided as Attachment F and is a part of the overall plan. .
9. MCC-M agrees to start providing Form 14 data. This data is to include the predicted latitude and longitude of the landing location. MCC-M will send the Form 14 data to the MCC-H ballistics dropbox. The transmission of data will start independent of MCC-M software changes to support any new landing site locations.
10. The team discussed the landing areas for ballistic reentry that were proposed during the August 2000 TIM. The TIM Participants identified the landing tracks attached as the best given the constraints of ballistic entry. The discussion and charts of the landing sites are provided in Attachment G. These landing areas are subject to Agency consideration and approval. Attachment G also discusses the advantages of a controlled entry to North America.
11. The advantages and increased safety to the crew and general populous by using a “controlled entry” to North America were thoroughly discussed. Significant advantages of the controlled entry to North America include: reduction in the size of the landing areas, risk mitigation and increased safety for the crew and general population, the reduction of the overall expenses, and significant reduction of the G-loads experienced by the crew. RSC-Energia requires funding to make the software and hardware improvements necessary to add controlled entry capability in emergency descent mode; Energia proposes that NASA provide this funding. This would require Program level approval.

III. Issues and/or Actions:

1. Contingency Landings are not identified in the existing MOU. Technical discussions at the TIM suggest that, in the spirit of the International Partnership of ISS, the existing agreements should be reviewed to account for these contingencies. This should be a NASA/Rosaviakosmos or governmental agreement.
2. Documentation and Agency level consideration and approval agreement of landing areas are required.
3. Program approval is required to fund KSC involvement in providing logistic and processing coordination and support for a Soyuz landing in the United States. Program approval is also required to fund the hardware and software improvements to the Soyuz TMA that would allow “controlled entry” capability for a landing in the United States. Such assistance is subject to existing export control regulations.

4. This TIM has agreed to continue the review of the attached checklists and procedures and these items should be included in the JOIP, Flight Rules or other Program documents as required to insure the safety of all concerned in the event of a contingency landing.
5. The Russian delegation urges that further discussions to determine the best means to approach other countries in which the Soyuz may land. These consultations should begin with Canada and Mexico.

IV. Data/Document Exchange:

1. RSC-Energia provided detailed information by fax before the meeting that included: Ballistic Materials for Organizing the Landing of Soyuz Vehicles in North America; Ground Support Hardware and Instructions and Descriptions for Maintenance Operations; Selection Criteria for Selecting Backup Landing Zones in North America, Proposed Changes and Supplemental Analysis of the Landing Areas in North America; and Information On The Controlled Entry. Digital photos of the Soyuz Vehicle from the September meeting in Moscow were also provided on a CD.
2. NASA provided to RSC-Energia US maps and analysis of the modified ballistic landing areas in North America, the Faxable Checklist for Search and Rescue, Faxable Checklist for Medical Operations and Proposed Processing Procedures for the Kennedy Space Center Team. These are included as attachments

V. Hardware/Software Exchange List:

(None)

VI. Agreements:

1. Attachments and Checklists will be thoroughly reviewed by both sides and final approval, where required, will be provided.
2. Under current guidelines, Option 2 for returning the Soyuz vehicle that was identified during the August 2000 TIM is unacceptable to NASA. Therefore Option 1 was adopted as the only available option.

NASA Signature (R. Pocklington)

RSC-Energia Signature (V. Timchenko)

NASA Signature (S. Johnston)

RSC-Energia Signature (A. Alexandrov)

NASA Signature (J. Curry)

RSC-Energia Signature (R. Ashimov)

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