Virtual United States Space Program
Program and Mission Proposal, Approval, Design and Implementation
Standard Operation Procedure (SOP)
Effective: March 9, 2003
Updated: April 19, 2020

I. PURPOSE: The purpose of this SOP is to standardize Program and Mission Proposal, Approval, Design and Implementation.

II. APPLICABILITY: This SOP is applicable to the VUSSP and all other support agencies in relation to Space Programs and Missions from any current or future launch facilities.

III. CONTROLLING AGENCY: The VUSSP is the sole controlling agency on IVAO for non-military Space Program and Mission facilities and operations based at KSC, JSC, Ames Research Center, Dryden Flight Research Center, GSFC, JPL, Langley Research Center, MSFC, Wallops Flight Facility, White Sands Test Facility, Vandenberg AFB and Kodiak Island and all other NASA related facilities world-wide.

IV. PRIMARY DIRECTIVE: The Primary Directive guiding all VUSSP operations is to pursue the future programs undertaken by the United States National Aeronautics and Space Administration likely to be undertaken by NASA or at a minimum within the reasonable scope of future NASA activity.

V. PROGRAMS: All VUSSP programs require the approval of the Administration and concurrence of the Executive Committee. The process by which Programs may be proposed for consideration is as follows:

A. B. Non-Historical Programs – As the VUSSP moves beyond the scope of the NASA Historical Program Suite, proposed new Programs may be put forth by the following: The VUSSP Executive Director, VUSSP Deputy Director, Director of Space Flight Operations, and any member of the Executive Committee. The proposal must be a complete analysis of the Program Goals, Mission set, Needs, and Outcomes. Upon analysis by the Administration, the Program Proposal may or may not be put before the Executive Committee for analysis and a recommendation. Following a decision not to pursue a Program by the Administration, or a rejection by the Executive Committee, the Program or any close variants may not be proposed again for a period of six months.

B. Approved Programs – Once a Program is approved it will be assigned to the appropriate VUSSP Division for operational control. Prior to initiation of the Program, the controlling division will prepare a complete proposal for Mission Initialization. This document will outline in detail what is planned, the hardware needs, special logistical needs, manpower and special training needs, and any additional information. This proposal will then be distributed to all of the Divisions within the VUSSP with responsibility for any aspect of the program. Within 14 days, those Division Directors must provide the controlling division with an outline of its plan to meet the needs of the program. Once all of these are received, the controlling division will prepare

a final plan for initiation of missions and submit it to the Executive Committee. The committee will review the proposal, needs and plans from the various divisions and set a timetable for initiation of the proposal.

VI. OPERATIONAL CONTROL: Once a Program has been approved, it will be assigned to one of the following VUSSP Divisions for Operational Control. This list should not be considered static and will certainly grow as the Historical Programs are completed and new and extraordinary programs push the VUSSP to the planets and beyond.

A. Space Flight Operations – This division is tasked with handling of all missions that take a VUSSP Pilot outside the Earth's atmosphere. For purposes of clarification, this will include any flight exceeding an altitude of 100 kilometers or achieving sub-orbit, or orbit.

B. Jet Propulsion Laboratory – This division is tasked with the study of Earth, its atmosphere and the near-space surrounding it. Only those missions whose specific purpose is to study this planet, its atmosphere and geodynamics will fall under the command of this division. In addition, this division is also responsible for all missions that take unmanned, remotely piloted, VUSSP spacecraft outside the Earth's atmosphere for the purpose of studying space and all bodies in it exclusive of Earth.

VII. MISSION PROGRESSION: Once a Program has been approved and the Executive Committee feels the needed assets are in place to begin Missions, the following progression will be initiated for the first mission and all those to follow within the approved program:

A. Mission Proposal – All Missions will come into being via a Formal Mission Proposal from the Director of the Division with Operational Control, or his/her designee, whom has been approved by the Administration. The Formal Mission Proposal shall be a Microsoft Word document outlining the proposed Mission; why it should be added to the launch schedule; the requirements, in manpower and technology; whether the needed technology is available and, if not, when it could reasonably be available; any specialized training required; any prerequisite missions; a general timeline for planning, development and implementation; and an analysis of why the mission benefits make it worth the effort required at this time.

B. The Formal Mission Proposal should be submitted to the Executive Director and Deputy Director. When possible, this should occur no less than 60 days prior to the tentative date for announcing the Mission. If the proposal is complete in the eyes of the Administration, it will be forwarded to the Executive Committee for their review. Once the Formal Mission Proposal has received a Go from the Administration and Executive Committee, it will be forwarded to all the VUSSP entities involved in any aspect of the Mission.

C. Mission Analysis – The Director of each entity will then have seven days to provide the Administration with an analysis of its readiness to provide what is needed to make the Mission a success. This should include a specific timetable outlining what is required and how long each aspect of preparation is expected to take. It must be remembered that some of these entities such as mission control operations and Mission Planning must provide services for every mission the VUSSP undertakes. While the Operational Control Division may have only one or two missions before them, these other divisions may be dealing with a half dozen Programs and scores of missions at any time.

D. Mission Scheduling – Based upon the reports provided by all the entities that are involved, the Administration will propose a Launch Date for the Mission and set specific pre-launch

deadlines that must be met for the launch to take place. This will go before the Executive Committee for concurrence. Should any of these deadlines not be met, the Administration and Executive Committee will assess what if any impact this will have upon the mission.

VIII. LAUNCH PLANNING AND READINESS: Approximately 30 days before launch activities, the controlling division will assess the development by polling each of the entities involved and ensure the prescribed launch deadlines will be met. At T-28 days, the Director of the controlling division will provide a complete update to the Administration along with support documentation from all associated entities. All launch events are subject to rescheduling/cancellation by the VUSSP Administration if it is considered in the best interest of the organization. This veto authority is absolute.

IX. LAUNCH NOTIFICATION: The PAO has the primary responsibly for preparing initial, modified, reschedule, and cancelled launch notification from VUSSP HQ.

1. Launch notification should be completed at least two weeks in advance of the launch event and consists of the following information (see Appendix A):

A. Mission name.
B. Mission objective.

a. For manned mission this should also include the primary and secondary astronaut team(s).

b. Unmanned mission should clearly state the purpose of the mission.

2. Significant events to occur during the mission.

A. Launch vehicle.
B. Launch complex.
C. Launch window(s). Include all appropriate launch windows.
D. Practice sessions/Training.
E. Restricted and/or Warning area closure request.
F. Outside agency support requirements to include ARTCC requirements. (*See Appendix C*)
G. Contact information. Usually this is the Launch Control Team Manager (mcod@vussp.org)
H. Special information not included above that may prove helpful to the VUSSP and outside agencies in providing support.

3. The PAO will submit the launch notification to the VUSSP Administration for approval. Upon approval the VUSSP Director, or his designated representative, will send notification to IVAO, IVAO SOD, and the ARTCC.

4. In addition to the formal notification, PAO will also prepare appropriate notification to all available media in addition to promotion of the event to VUSSP personnel.

5. The PAO will redirect any inquires about launch activities to the appropriate controlling agency.

6. All controlling agencies should and need to keep the PAO apprised of all events regarding a launch activity as they happen. This can be done through the staff@vussp.org email distribution.

X. LAUNCH TEAMS AND TRAINING: The Mission Control Operations Director has sole responsibility for assembling Launch Control, Mission Control and Recovery Control Teams. He will coordinate with other VUSSP Divisions for the availability of special expertise to fill certain positions. He is also responsible for coordinating all Launch Rehearsals.

XI. LAUNCH REHEARSAL: Launch Rehearsals are conduction under the authorization of VUSSP HQ and IVAO SOD. The MCOD is the primary responsible officer for launch rehearsals. General guidelines for Launch Rehearsal are:

1. Unauthorized rehearsal could be grounds from permanent dismissal from IVAO. It is therefore imperative that all launch rehearsals be coordinated with IVAO and the appropriate ARTCC before starting operations. VUSSP HQ will coordinate events via the launch notification letter.

2. A Senior VUSSP official will request and received proper authorization to control all VUSSP and participating agency aircraft from ARTCC prior to starting launch rehearsals. Control areas should be kept to a minimum and ARTCC advised of all activities.

3. Under no circumstance is any VUSSP controller authorized to use a non- existent controlling center. The use of CTR or any derivative is unauthorized.

4. All VUSSP stations, to include controlling agencies on IVAO using ProController should include in their ATIS messaging reference to the launch activity and the Point of Contact (POC) for launch activity. Normally this will be VUSSP_PAO.

5. All launch team members, participants, and controlling agencies are highly encouraged to use a common frequency for communication. This includes both IVAO text (COM) and voice channel. The VUSSP staff will determine the common frequency. (128.55 is recommended)

6. Communication to patrol/surveillance aircraft should be made in and through authorized control agencies. (KTTS_TWR, XMR_TWR, COF_APP).

7. Voice communications are to be used as the primary communication media when available.

8. Launch rehearsals normally should not be scheduled prior to 72 hours before launch; however, circumstances may require several "Dry runs." These should be communicated to the PAO in the launch notification

9. Under no circumstances will civil/general aviation traffic be diverted or intercepted in a launch rehearsal.

10. The VUSSP or other participating agency aircraft may intercept each other to practice maneuvers or reactions to unplanned events during launch rehearsals.

11. Upon conclusion of training, control agencies will release aircraft participating in operations to RTB (Return to Base) or to ARTCC. Under normal circumstances, all aircraft should RTB and all controlling agencies stay on line until the last aircraft has landed.

12. At the completion of training, it is highly recommended that an After Action Review (AAR) be conducted among the training staff to receive feedback on how to improve performance or better coordinate activity.

XII. PRE-COUNTDOWN: Pre-countdown activities include a variety of events conducted before the start of the actual countdown. They include, but are not limited to:

1. Coordination with the controlling ARTCC to begin operations, and answer any questions regarding procedures during countdown events. This should include the names of the launch participants, and the primary (INCO) and alternate contact for ARTCC.

2. Starting of various software applications used in countdown events. Verification of operation, and resolution of any outstanding issues or problems that may impact a successful countdown.

3. A complete briefing to all participants on event activities, to include proper procedure to be used for various events. It is very important that pilots understand their routes and roles and that controlling agencies (KTTS_TWR, COF_APP, XMR_TWR, etcetera) understand the limits of the restricted airspace and warning areas, what constitutes a violation, and the proper procedures to follow in case of a violation.

X. COUNTDOWN: Countdown events can last several hours depending on the complexity of the launch and software developed and used. It is probable that as more sophisticated software is developed so will the complexity of the countdown events. All countdown events are mimicked after real life launch procedures were possible. Before commencement and during countdown events:

1. VUSSP_INCO will request and receive from the ARTCC closure of all airspace around the Kennedy Space Center and Cape Canaveral Air Station. This includes R-2932 through R-2935. This closure will include an additional 10nm buffer zone that extends from the northern tip of Melbourne International (KMLB) west past the Titusville Executive Airport (KTIX) and north to the current center division line.

2. The VUSSP and other participating agencies will be authorized to intercept and escort any civil or general aviation aircraft flying within these areas. Notification procedures should be made to VUSSP_INCO who will coordinate with ARTCC and IVAO for appropriate action. It is imperative that once an incident has been determined to be a violation that:

    a. The offending pilot be contacted via private message or operating frequency that he is in violation of restricted airspace and advise of the severity of the problem. If the pilot acknowledges contact, is responsive, follows instruction and it is determined that the incident was coincidental, no further action is required.
    b. A screen capture of the offending aircraft via ProController is made.
    c. A capture of pilot login data as recorded at IVAO.ORG is made.
    d. That a complete summary of events be documented and submitted to the VUSSP Director.
    e. The VUSSP Director, or his designated representative, forward documents to include recommendations for action to IVAO SOD.

    f. NOTE: It is highly recommended that the vNSS participate in any interceptions. The vNSS should be tasked to provide two armed intercept aircraft on "hot standby" at Patrick AFB (KCOF). The VUSSP MOD/Director are the only persons authorized to release these aircraft for intercept.

3. All civil aviation aircraft will be allowed access for over flight of Warning Areas given that proper coordination between ARTCC and VUSSP_INCO has occurred. All over flight must clear the Warning Areas before the beginning of the last HOLD in the countdown event. If aircraft will not clear Warning Area prior to the last HOLD of the countdown, it will divert west of the Restricted Areas.

4. Before leaving the last hold, VUSSP_INCO will coordinate the closure of the effected Warning Areas to traffic with the ARTCC. Warning areas at this time will be treated in the same fashion as the restricted airspace.

5. All VUSSP and participating agencies will clear to the west of KSC/CCAS prior to coming out of the last hold. Intensified patrolling and surveillance should be conducted north, west, and south of KSC/CCAS while keeping all aircraft at least 5nm clear of the launch complex and totally free of the down range area.

6. VUSSP_INCO will report to FLIGHT that the range is HOT after Warning areas are closed.

XI. LAUNCH. The last few minutes of the countdown events are a very active and intense period. It is during this period where the launch team reaction to unexpected event can mean either the success of failure of a launch event.

1. During the final minutes of the countdown, and the initial launch period it is impetrative that:

    a. Controlling agencies monitor airborne traffic and report violations immediately according to establish procedures. This includes calling HOLD, HOLD, HOLD, and then stating the reason for the hold to the Flight Director.

    b. Participating aircraft stay clear of the downrange areas and continue post final hold patrolling patterns until told to do otherwise by controlling agencies.

c. All launch team member monitor their applications and report anomalies to the Flight Director.

d. VUSSP_INCO keep the ARTCC abreast of current airspace status as requested.

2. After launch, the MCOD will continue to monitor launch vehicle performance and telemetry data.

3. Upon clearing the tower of the launch complex, VUSSP_PAO, or the appropriate VUSSP event broadcaster will report "The TOWER IS CLEAR." At this point, the control of the launch vehicle is handed over to the appropriate VUSSP entity to monitor flight operations.

4. In the event of a no launch, scrub, catastrophic failure or other emergency the Flight Director will coordinate events with the respective emergency response agencies such at the vNorthstar Emergency Services. In addition, VUSSP_INCO will advise the ARTCC of the current situation and update as needed.

XII. POST LAUNCH. During post launch events, it is imperative that all agencies be kept current on all aspects that may affect their operations and/or mission objectives.

A. Upon a successful launch and clearance from the established Warning Areas of the launch vehicle, the Flight Director will declare the range open, or "COLD" and inform VUSSP_INCO to begin notifications.

B. VUSSP_INCO will communicate to the ARTCC that Warning Areas are now clear and may be opened at the discretion of the ARTCC.

C. Controlling agencies will continue to control aircraft and either release them to the ARTCC or instruct them to RTB.

D. All Controlling agencies will remain on line until the final aircraft wishing to RTB has landed and taxied off the active runway.

E. From time to time, the VUSSP may wish to carry on further post launch activities to include air-sampling mission in and around the launch area. If these events are planned, KTTS_TWR will be given permission to release aircraft for collection and scientific study.

F. After all participating aircraft activity has been completed, VUSSP_INCO will inform ARTCC that all launch activity has been completed and restricted airspace is now open to normal traffic.

G. Upon completion of launch, activity the MCOD will submit to VUSSP HQ a full report of launch activity.

XIII. RECOVERY OPERATIONS. Recovery operations should be coordinated with the vNORTHSTAR Emergency Services. This includes, but is not limited to:

a. *Identify Primary, Secondary, and any alternate recovery areas.*

b. *Identifying the Primary, Secondary and alternate recovery organization.*

c. *Notification and coordination between the VUSSP Mission Control Operations Division and the various affiliate organizations as to time, location, expected direction of travel of spacecraft, and requested participation.*

Since recovery and launch operations are considered "HIGH VISIBILITY OPPORTUNITIES" it is imperative that the VUSSP Mission Control Operations Division provide ample notification via the Public Affairs Office to all affiliates participating.

1. *The current recovery areas are identified by a single word phrase. These phrases are:*

    i. *PACIFIC: An area from 27 N 168 W to 25 N 163 W. This area runs from the northeast of the Hawaii Islands to the southwest.*

    ii. *ATLANTIC: An area from 22 N 71 W to 20 N 66 W. This area runs near the island of Grand Turk.*

    iii. *EDWARDS: Edwards AFB, California.*

    iv. *KENNEDY: Shuttle Landing Facility, Cape Kennedy, Florida.*

    v. *WHITE: White Sands, New Mexico.*

    vi. *CANTON: S004.862 W167.908(approx) 60nm north of Wooby intersection and 230 miles west of Canton Island. (Approx)*

2. *Virtual Northstar Emergency Services Co. are to be considered the primary and secondary recovery assets for the following areas:*

    i. *PACIFIC*

    ii. *ATLANTIC*

    iii. *CANTON*

3. *Assets for Recovery Operations should be left to the affiliate agency; however, optimal and minimal assets should be referenced in Appendix C of this SOP.*

4. *Affiliate organizations should be referred to this SOP and Appendix C for further information before contacting VUSSP Mission Control or any of the Executive Staff on their roles.*

XIV. CHANGES TO DOCUMENT. Changes to this document must be approved by VUSSP HQ. Items deleted with be lined out. (E.g., ~~this is lined out~~) New items will appear in *italics*.

APPENDIX A

Sample Launch Notification Message:

MERCURY ATLAS 7 LAUNCH NOTIFICATION FOR 16 FEB 2002 LAUNCH

First attempt: 0800 to 0830 hrs Eastern (1300 to 1330 hrs UT) 16 Feb 2002
Second attempt: 0800 hrs to 0830 hrs Eastern (1300 to 1330 hrs UT) 17 Feb 2002

Primary Location: Launch Complex 14, Cape Canaveral Air Station, Florida.

Launch Vehicle: Mercury Atlas
Mission: Mercury Atlas 7 (Final manned Mercury mission). Mission will include at least 4 orbits and up to 23 orbits. Mission time can run from six hrs to over 35 hours from liftoff to splashdown. A beacon tracking experiment is planned on the second orbit.
PRIMARY ASTRONAUT: Kayamone Sutton
BACKUP ASTRONAUT: Trish Simon

Expected Trajectory - easterly heading of 80 to 82 degrees. This event is expected to be carried by the media.

Pre-launch events will start approximately at 0500 hrs ET, 16 Feb 02. (1000 UT 16 Feb 2002).

A practice launch event will occur within a 72-hour window prior to launch. Coordination with MIA_ARTCC will be made before activities begin.

We are asking the MIA_ARTCC to keep air traffic at least 10 nm WEST of R-2932, R2933, R2934, and R2935; in addition, we request closing W497A and W497B. These restrictions apply from surface to unlimited. Closures will be coordinated with MIA_ARTCC at least 5 minutes prior to launch window and will reopen within 10 minutes after successful liftoff. In case of catastrophic failure or other emergency, restrictions will stay in place until danger to air/sea traffic has been assessed and/or is no longer a factor.

In addition we vNSS assets will be used to help keep restricted and warning areas clear of all VFR and IFR traffic during terminal countdown period and to provide assistance as needed in the event of a catastrophic failure, other emergency or operational needs by the VUSSP.

Recovery operations on the high seas are being requested from the vNSS. Primary and Secondary recovery information will be forthcoming. Please contact mcod@vussp.org for this information ASAP.

WORLDWIDE vNSS assets are requested to be on stand-by.

Additional information on this event, as well as future space launch activity, is available on the VUSSP website under the current launch information link. (http://www.vussp.org/launch/information.php) Information is updated to this site first.

We are asking all agencies, to include MIL_ATC, to contact mcod@vussp.org immediately for coordination and additional information.

Questions regarding this event should be directed to: mcod@vussp.org

APPENDIX B

A. In order to accommodate spectator viewing the following policy governing viewing are placed into effect:

1) Spectators are welcomed to all VUSSP events. It is VUSSP HQ policy to not only promote spectator viewing, but also accommodate, as technically feasible their participation in events.
2) Spectators wishing to watch events on line are welcome to view events from Space Coast Regional Airport (KTIX), Merritt Island Airport or by invitation only, the Shuttle Landing Facility (KTTS).
3) Since each of the viewing areas are in what is considered restricted airspace, those wishing to view launches should contact VUSSP_PAO or VUSSP_INCO for permission before logging into, or changing position to one of the viewing areas.
4) VUSSP_PAO or VUSSP_INCO will brief each spectator as to their responsibilities in viewing launches from KSC/CCAS.
5) Upon approval to view a launch, each spectator will squawk standby and indicate their flight plan that they are a spectator to launch activities.

B. In order to accommodate spectator listening of launch event, the following policy governing listing are placed in effect:

1) When launch events are broadcast via *VUSSP* Audio, all spectators will be referred to the *VUSSP* Audio broadcast when available.
2) When launch events are broadcast over Roger Wilco only, spectators are welcome to listen in RECEIVE MODE only. It is important that spectator understand that they are a guest on the channel and may be asked to leave without prior notification.

APPENDIX C

A. Affiliate participation is highly encouraged in all VUSSP events where possible. This is done through the VUSSP Mission Control Operations office in coordination with the VUSSP Executive Staff and Public Affairs Office. The VUSSP Director and/or his designated representative is the approval authority for all interagency participation requests.

B. Were applicable, reference in the SOP referrers to the Primary and Secondary organization and their role in both Pre-Launch, Launch, Post Launch, and Recovery Operations. The VUSSP Mission Control Operations Division, along with the Public Affairs Office will coordinate specific procedures for each phase with the affiliate. The minimal and optimal requires for each phase are:

l. Pre-Launch to Post Launch -

a. Minimal- vNSS

i. 2ea Fighter Aircraft stationed on "Hot Stand-by" at the nearest military/government facility.

ii. 1ea Search and Rescue (SAR) capable helicopter stationed on stand-by at the nearest military/government facility.

b. *Optimal*- vNSS

. *2ea Fighter Aircraft on patrol with 1 ea KC-135 Tanker within 5 minutes intercept range from the furthest point of the launch complex restricted zone. In addition on 1 hour worldwide readiness for response to any contingency. (Cargo)*

i. 2ea SAR capable helicopters with 1 ea C-130 equivalent aircraft on stand-by at the nearest military/government facility. 1ea Cutter class boat on stand-by at

least 50 nm out to sea and 10 nm south or north of the direct flight path of the launch vehicle.

ii. *1 hour worldwide response to any contingency consisting of at least 1ea carrier and two escort ships to include 2ea SAR capable helicopters and the ability to transport to the nearest friendly port of call or airbase via aircraft.*

2. *Recovery Operations -*

. *Minimal-vNSS*

0. *1-hour worldwide readiness contingency response. (Cargo)*

1. *1ea carrier and two escort ships to include 2ea SAR capable helicopters and the ability to transport to the nearest friendly port of call or airbase via aircraft.*

2. *1-hour worldwide response to any contingency consisting of at least 1ea Cruiser with 2ea (SAR) capable helicopters.*

a. *Optimal- vNSS*

0. *1-hour worldwide readiness contingency response. (Cargo)*

1. *1 ea complete battle group to include a full compliment of SAR helicopters and aircraft and the ability to transport to the nearest friendly port of call or airbase via aircraft.*

2. *2ea Cruisers with 2ea SAR capable helicopters with 1 ea C-130 equivalent aircraft on stand-by at the nearest military/government facility.*

C. The VUSSP will act as an augmentation force in any pre-launch to recovery operations. The VUSSP will be responsible for transport of all cargo, to include personnel from the nearest land base facility to Ellington Field, Texas (KEFD).

D. All affiliate participants must use the authorized VUSSP Roger Wilco channels to communicate. In addition, each affiliate must appoint a liaison officer who is NOT a VUSSP member to coordinate affairs with VUSSP Mission Control Ops. VUSSP Mission Control Operations division will be responsible to ensure all affiliates have the proper channels/frequencies, and documentation to properly perform the requested support.

E. All affiliates are required to perform an After Action Review (AAR) and submit their summary to the Mission Control Operations division of the VUSSP. This will help the VUSSP to be more responsive to the various needs of each affiliate.