OASD SATELLITE ENGAGEMENT COMMUNICATIONS PLAN, 14 FEB 08

Background

An uncontrollable National Reconnaissance Organization (NRO) satellite will reenter Earth's atmosphere between the end of February and early March. Analysis indicates that approximately 2,500 pounds (1134 Kilograms) of satellite debris will survive reentry including 1,000 pounds (453 Kilograms) of propellant fuel (hydrazine), classified as a hazardous material. Congressional leadership was updated on the situation by the NRO on 25 Jan 08 and State Department instructed U.S. Embassies to notify key foreign governments on 26 Jan 08. The President of the United States has made a decision to use the best available means to mitigate the hazard in order to minimize the risk to human lives. Actions for mitigation may begin as early as 15 Feb 08.

Public Affairs Posture

Following the public announcement by DoD, OSD public affairs will encourage an active posture in discussing this specific engagement and the situation. Questions beyond the scope of this guidance will be referred to OASD/PA. DoD has the PA lead through engagement, reentry and tracking phases. The debris field from this reentry could extend over multiple areas, over multiple days. If debris from this satellite lands in the United States, lead for public affairs shifts to DHS. If debris from this satellite lands outside the United States, lead for public affairs remains with DoD, with DOS supporting through public diplomacy activities in any affected foreign countries.

Objectives

- Reinforce key message that the USG is committed to safe, responsible space operations, and is concerned about public safety.

- Maintain or improve the lines of communication with allies and other foreign governments to ensure timely and accurate information is conveyed.

- Build confidence that the USG elements are equipped, trained and ready to respond around the globe.

- As accurately, completely, and expediently as possible, answer queries from the media and the public regarding U.S. efforts to address reentry of the U.S. satellite.

Key Themes and Messages: ENGAGEMENT

- The President of the United States has decided to take action to reduce the small risk to people and property by engaging a non-functioning decaying U.S. satellite about to reenter Earth's atmosphere.

- Based on our modeling and analysis, we have high confidence that this engagement will be successful. The distinguishing facts with this satellite are 1) the amount of material expected to survive reentry, 2) the amount of hazardous material (1,000 pounds of hydrazine), and 3) the fact that this satellite is uncontrollable.

    - In a controlled reentry, we have the opportunity to manage risk by causing the reentry to occur over the ocean or sparsely populated areas.

    - In the past, no feasible options existed to mitigate the risks associated with a similar uncontrolled reentry of hazardous material.

- After long and thoughtful consideration, the decision to engage our satellite was selected as the best course of action to mitigate risks to human lives from an uncontrolled satellite carrying about 1000 pounds of hazardous fuel.

- This decision was not taken lightly. In order to engage this satellite, our existing defensive system required significant modification.

- This option lowers the risk to those on Earth.

- Timing of engagement is dependent on the location of the satellite. We will engage at a low altitude where we can expect the greatest probability of success while minimizing risk to other space objects and to people from falling debris.

- Our intent is to maximize probability of success and minimize the risk of falling debris and hazardous fuel from hitting the earth, and ensure negligible space debris.

- This capability was not previously part of the SM-3 designed capability; extensive modifications were required.

Reentry themes and messages

- The U.S. is committed to safe and responsible space operations. This includes taking responsibility for our falling debris and doing everything possible to mitigate its impact for this engagement.
- Experts are unable to determine when and where debris will reenter prior to engagement.
- This satellite reentry is solely a U.S. responsibility.
- In the event pieces from this reentry impact populated areas and causes damage, the United States will offer to respond promptly.
- Experts from across DoD and the U.S. government have been working diligently to assess the potential hazards associated with the debris. (This area of concern shifts to DHS/DOS as appropriate.)
- The Federal Emergency Management Agency (FEMA) and other federal agencies have been planning for and are ready to respond to this situation.

Space themes and messages

- The United States has developed, launched and is operating many incredibly complex systems. History has demonstrated clearly that not all efforts will be successful.
- For more than 50 years, it has been our longstanding policy and belief in the right of all nations to use space for peaceful purposes. This is reflected in the 1967 Outer Space Treaty, to which all major space-faring nations are party, including the United States. It is also reflected in the U.S. National Space Policy.
- Reentry of low-earth orbiting objects is a common occurrence. Hundreds of satellites have de-orbited over the past 50 years. Each year, space objects of varied size and shape reenter the Earth's atmosphere, some in a controlled manner and others uncontrolled. Since 2005, roughly 210 objects have reentered the Earth's atmosphere.

- The United States and other nations that are parties to the Outer Space Treaty are responsible for all aspects of their respective space activities.

Tactics:

AUDIENCE	PRINCIPAL	STAFF	TARGETS	TACTICS	STATUS
Interagency	NSC, DOS, DHS	OSD (Mr Henry), JCS (Gen Cartwright), DHS/FEMA	NSC, WHO-LA, DOS, Select Agencies	Complete interagency coordination of PA products	On-Going
Foreign Governments	DOS	DOS (Mr Buenneke, Mr Katsapis)	Burnt Frost partners, MD Cooperative Program partners, Allies approached for Chinese ASAT demarche, other major spacefaring nations notified on reentry	Conduct Diplomatic Notations, Briefings to Washington Diplomatic Corps	Estimated Start: 14 Feb 08, 1130 hrs
International Organizations	DOS	DOS (Mr Buenneke, Mr Katsapis)	NATO, UN Security Council, Conference on Disarmament, Committee on the Peaceful Use of Outer Space, European Space Agency	Conduct Diplomatic Notifications	Estimated Start: 14 Feb 08, 1130 hrs
Congress	OASD/LA	Amb Jeffrey (NSC), Mr Henry (OSD), Gen Cartwright (JCS), Mr Griffin (NASA), Gen Chilton (STRATCOM)	Senate, House	Conduct Congressional Briefings	Estimated Start: 14 Feb 08, 1230 hrs
Media & US/Intl Public	OASD/PA	NSC (Amb Jeffrey), JCS (Gen Cartwright), DHS (Mr Cannon), NASA (Mr Griffin)	National/International Press	Conduct DoD Press Briefing	Estimated Start: 14 Feb 08, 1430 hrs

AUDIENCE	PRINCIPAL	STAFF	TARGETS	TACTICS	STATUS
Echo Chamber	OASD/PA	OASD/PA (Ms Healy, Lt Col Finn, Maj Ryder)	Opinion Influencers	Conduct Conf Call for Military Analysts	Estimated Start: 14 Feb 08, Time TBD
Potential Country (Countries) of Impact	DOS	DOS(Mr Buenneke, Mr Katsapis) , NRO Task Force, USSTRATCOM, NASA	Foreign national governments, regional and local first responders	Provide consequence management advisories (NLT 28 Feb 08); Diplomatic and NASA notifications satellite orbit and Tracking and Impact Predictions (T-4 days and onwards); Publication of Impact Prediction Lines (T-24 hours and onwards)	Estimated Start: Date/Time TBD
Potential Country (Countries) of Impact	DOS	USSTRATCOM, Appropriate COCOM, Interagency Hydrazine Response and Payload Recovery Teams	Foreign national governments, regional and local govts, local population	Conduct Consequence Mgt and payload recovery in foreign nation(s) where debris lands	
Media & US/Intl Public	OASD/PA	OSD (Mr Henry), JCS (Gen Cartwright)	National/International Press	Conduct Press Briefing and/or Issue News Release on Engagement Results	Estimated Start: Date/TimeTBD
DoD members	OASD/PA	OASD/PA (Ms Gleason, Ms Ressler)	Internal Audience	Obtain AFIS, Pentagon Channel Coverage	Estimated Start: Date/Time TBD

QUESTIONS & ANSWERS:

Political/Policy

Who made the decision to engage the satellite?

- The President made the decision to engage the satellite. He did so based on recommendations from his national security advisors in the interest of mitigating the risk to human life from the toxic hydrazine fuel onboard.

Why are you doing this?

- This reentry is not similar to previous reentries for three reasons 1) the amount of material expected to survive reentry, 2) the amount of hazardous material (1,000 pounds of hydrazine), and 3) the fact that we have no control over the satellite, making it impossible to direct its descent.

- The NRO satellite contains about 1,000 pounds of hydrazine fuel encased in a titanium tank. Although we cannot predict where this tank will land, we believe that the tank is likely to survive reentry and break up upon impact, releasing the toxic hydrazine.

- Hydrazine is hazardous. If we do not take this action, there is a small chance that the hydrazine will land in a populated area and cause injury or death.

- Given this risk, we will try to prevent the hydrazine fuel from causing injury or death. Modification of missile defense interceptors is the only option we have available to us. Other options such as using the Space Shuttle to recover the satellite are not feasible.

- If this operation is successful, we anticipate fragmenting the fuel tank, causing the hydrazine to dissipate prior to entering the atmosphere or during its descent. The hydrazine will then not pose a risk to human lives.

- We will choose the time, location, and geometry of the intercept to maximize the probability that we will destroy the hydrazine fuel tank, thereby minimizing the risk from space or ground debris.

When will the engagement occur?

- Regarding the specific timing of the engagement, we have to wait until the satellite is low enough for the modified sea-based interceptors to be able to engage it successfully. As the satellite's orbit continues to decay, we have a window of opportunity to mitigate any potential risks.

How exactly will the US military engage this satellite? With what weapon system?

- To prepare to engage this satellite, we had to make modifications to three sea-based missile defense interceptors, three ships, and the system's command-and-control software. We have not made these modifications to any other missile defense system, nor do we plan to. None of our other missile defense systems have the capability to engage a satellite.

- Any of these interceptors that are not used, the ships and the system's command-and-control software will be returned to their original configuration as a defensive capability.

What is the chance of success?

- We have undertaken extensive modeling, based on all available data, and are confident we understand the requirements for success.

- (If pressed) We will not discuss hypotheticals or speculate on statistical odds of success.

Didn’t earlier statements from U.S. officials indicate that there is very little risk of the re-entry causing harm?

- We have concluded that, although the risk from a natural reentry is not high, we cannot rule out the possibility that the hydrazine fuel could cause casualties on the ground. We will do whatever we can to mitigate this risk.

What other options were considered or are available?

- We could do nothing, allowing the satellite to reenter with roughly 1,000 pounds of hazardous fuel.

- Other options, such as using the Space Shuttle to retrieve the satellite, are not feasible.

- Modification of missile defense interceptors is the only option available to mitigate the risk posed by the reentering hydrazine fuel.

Why are you taking this action now, given that the satellite has been in decay for more than a year?

- We have been monitoring the satellite for more than a year. As reentry approached, we examined alternatives to mitigate the risks to human life.

- Regarding the specific timing of the engagement, we have to wait until the satellite is low enough for the modified sea-based interceptors to be able to engage it successfully. As the satellite's orbit continues to decay, we have a window of opportunity to mitigate any potential risks.

So our missile defense system has a dual role as an ASAT weapon?

- Our missile defense systems were not designed to engage satellites. They are designed only to engage ballistic missiles.

- To prepare to engage this satellite, we had to make modifications to three sea-based missile defense interceptors, three ships, and the system's command-and-control software. We have not made these modifications to any other missile defense system, nor do we plan to. None of our other missile defense systems have the capability to engage a satellite.

- Any of these interceptors that are not used, the ships and the system's command-and-control software will be returned to their original configuration as a defensive capability.

- The U.S. has no need to test kinetic anti-satellite capability. We did so successfully in 1985 and subsequently made the decision that this is a capability that we do not need to have.

How can you criticize China for doing the same thing in January 2007?

- There is no equivalence between China’s anti-satellite (ASAT) test and the President’s decision to mitigate the unique hazards to human life.

- The United States is not doing this to test an ASAT capability. We are announcing our intentions, and we are conducting the engagement with the goal of preventing hydrazine from causing potential harm on the ground.

- In contrast, China deliberately destroyed a satellite in a healthy orbit for the purpose of testing an active ASAT capability. It destroyed the satellite at an altitude of over 800 kilometers, resulting in thousands of pieces of long-lived orbital debris that could remain in orbit for over a century.

- Furthermore, China conducted its ASAT test in secret, without notifying other nations of the risk to other nations' space assets that would be generated by its actions.

- We will choose the time and place of this engagement specifically to minimize the risk resulting from space and ground debris.

- We will choose the time, location, and geometry of the engagement to maximize the chance of hitting the fuel tank and to ensure that the resulting debris will not linger in space for a long period of time and therefore will not present a threat to other nations' satellites.

    - Much of the debris will fall in a few hours.
    - The limited debris will not affect any healthy orbiting space systems
    - Most of the rest of the debris will reenter in several weeks.
    - Most of the reentering debris will bum up in the atmosphere.
    - This engagement will not create significant long-lived debris.

- The engagement point will be chosen also to ensure that the initial debris has very little chance of hitting a populated area. If we are successful, the fuel tank will rupture, and the hydrazine will dissipate before it could cause harm.

How does the debris created by this engagement compare with that generated by China's ASAT test?

- China deliberately destroyed a satellite in a stable orbit for the purpose of testing an anti-satellite (ASAT) capability. It destroyed the satellite at an altitude higher than 800 kilometers, resulting in long-lived orbital debris some of which will remain in orbit well into the twenty-second century.

- By contrast, the U.S. engagement attempt will be conducted at a significantly lower altitude (somewhere below 250 km), avoiding the creation of long-lived debris.

How is the U.S. planning the engagement to minimize debris hazards?

- This engagement will not create significant long-lived orbital debris or additional hazards from re-entering debris.

- We will choose the time and place of this engagement specifically to minimize the risk resulting from orbital and re-entering debris.

    - We will choose the time, location, and geometry of the engagement to maximize the chance of hitting the fuel tank and to ensure that the debris resulting from the engagement will not linger in orbit for a long period of time and therefore will not present a threat to human spaceflight and other space activities.

    - The engagement point will be carefully chosen to minimize the probability that the initial debris re-entering after the engagement will impact a populated area. If we are successful, the fuel tank will rupture, and the hydrazine will dissipate before it can cause harm to human life.

Aren't you really doing this to prevent your satellite technology from falling into the wrong hands?

- No. We are doing this to mitigate the risk could be caused if the satellite's toxic hydrazine fuel were to reenter naturally and impact in a populated area.

Will this set a precedent for other countries to take similar action?

- In a similar situation, we would expect all countries to act transparently and responsibly to reduce risk.
- U.S. actions to engage a falling satellite do not justify the development of offensive anti-satellite weapons by others.

Will this set a precedent for shooting down other objects in the future?

- No. We are doing this to mitigate the risk that could be caused if the satellite's toxic hydrazine fuel were allowed to land.

How is this engagement consistent with past U.S. claims that U.S. space control activities would focus on "temporary and reversible effects" to deny an adversary's use of outer space?

- The U.S. attempt to eliminate the hazard posed by this uncontrollable satellite is an effort to respond to an extraordinary situation to prevent a possible loss of human life.

- The effort to modify Navy SM-3 missiles and Aegis ships for this unique operation focused exclusively on eliminating the threat posed by a large and frozen tank of toxic hydrazine on an uncontrollable and non-functional U.S. satellite.

- The U.S. has no need to test kinetic anti-satellite capability. We did so in 1985 and subsequently made the decision that this is a capability that we do not need to have.

- (If Pressed) The U.S. also has no plans to develop, test, or deploy a dedicated anti-satellite interceptor using the adapted technologies for this project.

Diplomatic

What actions have we taken to notify other nations that we will engage the satellite?

- Nations are being kept apprised of the situation.

- We are notifying our allies and other major space faring nations, as well as nations belonging to the United Nations Committee on the Peaceful Uses of Outer Space, the Conference on Disarmament, and members of the United Nations Security Council. All U.S. diplomatic posts are prepared to answer host government questions regarding the engagement and consequence management preparations.

Has the U.S. been consulting with its partners in missile defense or military space cooperation in preparations for this engagement?

- We are notifying foreign governments worldwide of the President's decision.

- We will also work with foreign governments on preparations for consequence management in the event the engagement attempt does not mitigate the hydrazine hazard.

What has been their reaction?

- I'd have to refer you to the State Department.

What effect will this have on ongoing cooperative missile defense activities, for example with Poland, the Czech Republic, and Japan?

- We have notified our missile defense partners both of our dilemma and of our intended course of action. We expect our ongoing missile defense activities to continue.

- Our bilateral missile defense cooperation programs are a consequence of the proliferation of weapons of mass destruction and ballistic missiles as a means of their delivery. The threat to allies and friends from rogue states is increasing. Missile defenses are critical in defending populations and territory.

- Our allies and friends involved in such missile defense cooperation recognize the threat and are deeply committed to cooperation.

Does the U.S. plan to provide a "satellite intercept" capability to Japan and other nations partnered with the U.S. in the SM-3 missile defense program?

- No. Only three U.S. SM-3 missiles and three ships were modified to eliminate the hydrazine threat on the satellite.

- No additional SM-3s or Aegis ships will be modified with capabilities for satellite engagement.

- Any of these interceptors that are not used, the ships and the system’s command-and-control software will be returned to their original configuration as a defensive capability.

Will any of the Ground Based Interceptors deployed in the United States or Poland have an ASAT capability?

- No. The U.S. will not modify any Ground Based Interceptors to make them capable of engaging satellites.

- The U.S. has no plans to adapt any technology from this extraordinary effort on any other current or planned weapon system.

Will the X-band tracking and discrimination radar planned for the Czech Republic be modified for an ASAT capability?

- The U.S. will not modify the X-band radar to make it capable of supporting satellite engagements.

Will this set a precedent for other countries to take similar action?

- In a similar situation, we would expect all countries to act transparently and responsibly to reduce risk of the potential loss of life.

- U.S. actions for this extraordinary engagement can not be used legitimately by others to justify an offensive anti-satellite weapon program.

What role are overseas U.S. space surveillance sensors at RAF Fylingales in the United Kingdom, Thule Air Base in Greenland, the X-Band radar in Shariki in Japan, and sensors at other overseas locations playing in this engagement?

- Overseas sensors will not be used in this engagement. However, such sensors may be used to track debris once an engagement has been made.

In light of past Russian assertions about the hidden ASAT capability of U.S. missile defenses, what additional transparency and confidence-building measures is the U.S. willing to consider to reassure Russia that Ground Based Interceptors or the X-band radar in Europe will not possess an ASAT capability?

- The U.S. has offered numerous transparency and confidence-building measures to assure the Russian Federation that our limited missile defense capabilities planned for Europe are not directed against Russia.

- The U.S. systems proposed for deployment in Europe will not have an ASAT capability.

Will the U.S. re-consider its strong opposition to the Russia's proposal for a "Prevention of Placement of Weapons in Outer Space Treaty (PPWT)"?

- No. For the past 30 years, no U.S. Administration has been able to find a proposal for a space arms control treaty that is verifiable and in the national security interest of the United States.

Does this action herald the start of a new arms race in outer space?

- No. The Cold War is over.
- The U.S. emergency and limited capability for this mission was developed solely to mitigate potential hazards to the population of the Earth.
- By providing prior notification of this engagement attempt, the U.S. is demonstrating its transparency and humanitarian intentions.

Legal

Is this action legal?

- Yes. There is no prohibition under applicable international law to taking this action.
- This extraordinary engagement attempt is being conducted in full compliance with the 1967 Outer Space Treaty, 1968 Rescue and Return Agreement, 1972 Liability Convention, and the 1975 Registration Convention.
- Given the situation we face, we believe taking this action is appropriate and consistent with our role as a responsible space-faring nation.

Who's legally responsible for any damage outside of the U.S. caused by the engagement or the satellite's re-entry?

- The United States is a Party to the Outer Space Treaty and the Convention on International Liability for Damage Caused by Space Objects.
- The U.S., by treaty, has international responsibility for its satellites and space activities.
- The 1972 Convention on International Liability for Damage Caused by Space Objects provides that a party will be "absolutely liable" for damages "caused by its space object on the surface of the Earth or to aircraft in flight." The United States is a party to that convention, so any U.S. liability to other treaty parties would be determined in accordance with its terms.

Does this engagement attempt violate any Congressional restrictions on anti-satellite testing or limitations on modifying missile defense assets for anti-satellite missions?

- No. There are no U.S. domestic law prohibitions against taking this action.

Is this engagement attempt contrary to any voluntary international guidelines on safe space operations?

- No. This engagement attempt is being planned and will be conducted to conform with international guidelines on orbital debris mitigation.

Who will pay for the costs of the clean-up of hazardous materials that might be created by the re-entry of this U.S. satellite?

- The United States expects that it would pay for such costs associated with any hazardous material clean-up that might result from this event.

Technical

What modifications were made to the sea-based missile defense system?

- The Aegis Weapon System has design features that specifically preclude it from intercepting satellites. We have modified three SM-3 missiles, and the radars and command-and-control suites on three ships

Were the modifications significant?

- The data collection, engineering, and analysis efforts were very significant. The changes to the system were accomplished by modifying software within the Aegis BMD System.

How will we monitor the event?

- We will use a diverse set of existing national-level sensors to monitor this event. We will use all of these sensors to monitor the engagement attempt to manage the risks of post-engagement debris.

How and when will we know if this is successful?

- We anticipate having data from the SM-3 missile that will provide immediate indications that the satellite has been hit. We expect to have good indications if we ruptured the tank in the hours and days that follow.

Did you consider using other missile defense interceptors, for example Ground Based Interceptors?

- The mobility of sea-based interceptors gives us the flexibility needed to choose the precise engagement location to ensure a high probability of hitting the satellite and a low probability of creating persistent debris.

Will this engagement interfere with the ongoing Space Shuttle mission?

- No. The engagement will occur after the Shuttle returns to earth.

What analysis of likely debris did you perform prior to this test?

- The Department of Defense conducted extensive analyses in conjunction with leading experts from NASA and other U.S. Government agencies.

- The engagement attempt has been designed to minimize the amount and duration of debris in low-Earth orbit.

How will this engagement affect the International Space Station?

- The risk to the International Space Station (ISS) from this engagement will be very limited. A full 99 percent of the debris resulting from the engagement will reenter the Earth's atmosphere within one week. The cumulative risk to the ISS will be equivalent to only 2-3 days of exposure to the background meteoroid and orbital debris environment. The ISS is now in its tenth year of operation and has not encountered any serious damage due to meteoroids or orbital debris during that time.

How will you ensure that any engagement will not cause hazards to human spaceflight and other space missions?

- The risk that debris from an engagement would pose a unique hazard to human spaceflight dissipates within forty-eight hours after an engagement. As a result, there is no related hazard to the next Shuttle mission scheduled for launch on or after March 11 or subsequent human spaceflight missions.

- The risk to the International Space Station (ISS) from this engagement will be very limited. A full ninety-nine percent of the debris resulting from the engagement will reenter the Earth's atmosphere within one week. The cumulative risk to the ISS will be equivalent to only two to three days of exposure to the background meteoroid and orbital debris environment. The ISS is now in its tenth year of operation and has not encountered any serious damage due to meteoroids or orbital debris during that time.

How does this engagement square with U.S. efforts to take a leadership position in the minimization of space debris?

- The U.S. continues to have the world's strongest domestic regulations for space debris mitigation. The U.S. also continues to support the debris mitigation guidelines developed by the Inter-Agency Space Debris Coordination Committee (IADC) and the United Nations Committee on the Peaceful Uses of Outer Space. This engagement attempt falls well within these sets of international guidelines, since orbital debris from this test will be extremely short-lived.

- (If pressed) International guidelines emphasize the need to minimize the creation of "long-lived" orbital debris which remains in orbit for twenty-five years or longer. The vast majority of debris from a successful engagement attempt will have re-entered within thirty days. By comparison, most debris from China's January 2007 satellite intercept will remain in orbit for at least three decades, but with some remaining debris well into the twenty-second century.

Is there a radiation risk from this satellite?

- No. This U.S. spacecraft contains no nuclear power source and contains no radioactive components.

<u>Consequence Management and Payload Recovery</u>

What is FEMA doing to prepare for an impact in the United States?

- The FEMA Operations Center (FOC) in Washington, DC, is in constant contact with DoD and will notify all States and interagency partners via the National Warning System (NAWAS) with information concerning the reentry of the satellite and debris field once it is known.

- FEMA is coordinating six Federal interagency support task forces comprised of FEMA's hazardous material-qualified Urban Search and Rescue Task Forces, U.S. Department of Health and Human Services (HHS) medical support personnel, Environmental Protection Agency (EPA) and U.S. Coast Guard hazardous material specialists.

- These teams will be immediately available to the States to assist the State(s) in their response. Other Federal assets will be on alert and prepared to respond as needed.

- FEMA has pre-identified a Federal Coordinating Officer (FCO) and has assembled deployable support staff at FEMA Headquarters to lead the Federal response effort.

- FEMA is developing detailed guidance to share with State and local first responders to ensure that all levels of government will be prepared should the satellite impact the United States.

What should somebody do if the object lands in their backyard?

- Any debris should be considered potentially hazardous and should not be touched, handled or moved.

- People who observe or encounter falling debris should notify local emergency responders and stay away from it.

What would the United States Government do if hydrazine or other large pieces of debris from the satellite impact on foreign territory?

- In accordance with the 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space ("Rescue and Return Agreement"), and with the 1972 Liability Convention, the United States is making preparations to take immediate and effective steps to eliminate possible danger of harm should hydrazine or other hazardous materials from this spacecraft return to the territory of another State Party. As the Rescue and Return Agreement provides, these steps would be taken under the direction and control of the State Party within whose territorial limits the hazardous material returns if that state so requests.

- Should there be recoverable debris or component parts that land on the territory of a foreign government, the United States may wish to recover them in accordance with Article 5 of the Rescue and Return Agreement.

What will be the role of the U.S. Government in preparing to manage the consequences of a satellite re-entry?

- The U.S. government plans to track, monitor and plan for the re-entry of this satellite. A U.S. Government Interagency Working Group, comprised of senior officials from the National Security Council, Office of Science and Technology Policy, Department of Defense, Department of State, U.S. Strategic Command, NASA, and Department of Homeland Security, and FEMA has been established to ensure that any actions the U.S. takes are fully coordinated.

Does the U.S. Strategic Command give warning to civilian populations on a point of impact of satellite debris?

- No. It is virtually impossible to predict where and when space debris will impact. This is due to limitations in our tracking system as well as environmental factors, including variations in the gravitational field of the land mass and ocean areas, solar radiation pressure and atmospheric drag.

General Background

How does the United States predict a satellite re-entry?

- Objects are tracked throughout their orbit life. When an object appears to be re-entering within seven days, orbital analysts in the Space Control Center (SCC) will increase sensor tasking (monitoring) and begin to project a specific re-entry time and location. At the four-day point, a monitor run is accomplished once a shift or three times a day. Messages indicating the calculated re-entry time and location are transmitted to forward users and customers (e.g., sensor operators that will be tracking, the Federal Emergency Management Agency, the U.S. Air Force's 14th Air Force) at the four-, three-, two- and one-day points. Starting at the 24-hour point, the object is monitored at the highest level of scrutiny, with processing at the twelve, six and two-hour points. Again, ground traces and messages are transmitted. The object is monitored throughout re-entry.

How does the United States determine that a space object has re-entered?

- We verify that an object has re-entered when the object has three "No Show" sensors verifying the object is no longer in orbit. Once it is determined not to be in orbit, sensor tasking ends and the object is deleted from the "Active" catalogue. The object remains in the inactive catalogue for historical purposes.

Who tracks objects in space?

- U.S. Strategic Command's Joint Functional Component Command (JFCC) for Space, at Vandenberg Air Force Base, California is responsible for tracking man-made objects larger than ten centimeters orbiting Earth. Five three-person crews of orbital analysts work around the clock, 365 days a year, to track these objects constantly. They task a worldwide network of 17 space surveillance sensors (radar and optical telescopes, both military and civilian) to observe the objects.

How many objects have returned to Earth?

- Since tracking began with Sputnik, more than 17,000 (17,218) man-made objects that U.S. Strategic Command tracked have re-entered the Earth's atmosphere.

- There are more than 9,600 (9,620) objects currently orbiting the Earth. U.S. Strategic Command has tracked approximately 26,000 (25,949) objects in its space catalog.

Do you have an estimate of the number of decayed objects that actually hit the ground?

- No. Unless an object is actually found and returned to the U.S. Government, we would have no knowledge of whether or not an object survived re-entry.

What are the chances of someone being struck by an object returning through the atmosphere?

- The chances of someone being struck by a re-entering object are slight.

- The great majority of objects that re-enter disintegrate due to the intense heat created by re-entry into the Earth's atmosphere. Only a small percentage of objects ever re-enter over land since water comprises 75 percent of the Earth's surface. Only about 25 percent of the Earth's landmass is actually inhabited.

What is the debris hazard associated with the re-entry of the satellite?

- If the missile engagement is not successful, analysis indicates that fragments totaling approximately 2,500 pounds (1134 Kilograms) of satellite mass could survive re-entry including 1,000 pounds (453 Kilograms) of hydrazine. In comparison, Skylab fragments totaled approximately 31,000 pounds, or 69,000 kilograms.

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