FUTENMA REPLACEMENT FACILITY
BILATERAL EXPERTS STUDY GROUP REPORT

August 31, 2010

MANDATE AND SCOPE OF WORK:

In order to achieve the earliest possible relocation of Marine Corps Air Station Futenma, the U.S.-Japan Security Consultative Committee (SCC) directed a group of experts to study the Futenma replacement facility's location, configuration and construction method. In accordance with the criteria decided upon in the 28 May 2010 Joint Statement of the SCC, the Experts Study Group (ExSG) considered factors such as safety, operational requirements, noise impact, environmental concerns, and effects on the local community. In addition, the ExSG also considered the cost and construction timelines. The ExSG noted that the 28 May 2010 SCC Joint Statement confirmed the replacement facility will be located at the Camp Schwab Henoko-saki area and adjacent waters, with the runways portion(s) of the facility to be 1,800 meters long, inclusive of overruns, exclusive of seawalls; the Joint Statement further stated the intention to locate, configure, and construct the replacement facility in such a manner as to ensure that the environmental impact assessment procedures and construction can be completed without significant delay. Given the nature of the issues as well as the time constraint for the study, some issues pursuant to implementation may require further study. The findings of the ExSG are subject to verification and validation by the time of the next SCC, which will announce a decision. Agenda items from the 28 May 2010 SCC Joint Statement outside the mandate of the ExSG will be dealt with in appropriate forums.

PARTICIPANTS:

Lead participants in the ExSG on the U.S. side included Director-level representatives from the Office of the Secretary of Defense, the Department of State, and the United States Military; lead participants from the Japanese delegation included Director-level representatives from the Ministry of Defense, the Ministry of Foreign Affairs, and the Cabinet Secretariat.

EVALUATED PLANS:

The ExSG evaluated several possibilities for the location, configuration, and construction method of the replacement facility. After technical discussions on the aforementioned factors, including construction timeline and cost, the ExSG focused on two plans for the replacement facility. One plan studied was the "V"-plan, the two-runway V-shaped configuration described in the May 1, 2006 Roadmap for Realignment. The other plan studied was the "I"-plan, a single runway I-shaped configuration also developed by the Government of Japan (GOJ). Both facilities utilize reclamation of the sea as the primary construction method and would be located in the Camp Schwab Henoko-saki area and adjacent waters.

The ExSG studied the Pile Supported Pier Type. However, the ExSG could not determine that this method was suitable for the construction of the replacement facility primarily due to concerns about force protection, survivability, maintainability, and the lack of experience with this construction method for U.S. military and Japan Self Defense Force airfields. Therefore, the ExSG concluded that reclamation of the sea was the construction method most suitable for the replacement facility.

Consistent with the May 28, 2010, SCC Joint Statement, the ExSG evaluated these two plans against the following criteria.

- Safety of both local communities and U.S. military personnel.
- Operational requirements for U.S. Forces, including wind alignment and throughput capacity, and the impact of local terrain on instrument approach capabilities.
- Noise impact.
- Environmental concerns, including impact on marine life.
- Effects on the local community.

The ExSG also considered cost and construction timelines.

The ExSG noted that any replacement facility plan must be both operationally viable and politically sustainable over the long term.

The ExSG evaluated the two plans based on the aforementioned factors. In this regard, the ExSG also noted that any plan must incorporate all related operational and airfield support infrastructure, maintenance facilities, and station personnel for a fully operational Instrument Flight Rules (IFR) capable airfield that would be oriented and designed to ensure precision and non-precision instrument approach capabilities from all runway directions.

The ExSG noted that visual flight patterns will be established based on standard aviation practices, operational requirements and safety, and with consideration for impacts on local communities, including overflights and noise. The United States Government (USG) and GOJ will continue to consult with respect to visual flight operations through established procedures.

The ExSG also noted that, as long as the environmental impact assessment procedures and construction could be completed without significant delay and U.S. operational requirements continue to be met, the possibility of adjustments to the plans in the process of verification and validation could not be excluded.

THE "V" PLAN:

The plan described in the Roadmap would consist of two runways in a V-shaped configuration (Graphic 1). In the existing design, one runway would have a 07/25

orientation with the other runway oriented at 05/23. The V-shaped configuration would enable aircraft flight paths for takeoff and landing to occur over water (Graphic 2). To avoid overflight of land for arrivals from the southwest, Runway 05 would be designated the primary arrival runway. To avoid overflight of communities for departures to the northeast, Runway 07, in turn, would be designated the primary departure runway (Graphic 3). When predominant winds dictate arrivals from the northeast, Runway 25 would be designated the primary arrival runway; Runway 23, in turn, would be the primary departure runway to the southwest (Graphic 4). This configuration would also provide redundant runway and instrument approach procedure capabilities.

The ExSG evaluated the V-shaped configuration against the aforementioned criteria, and reached the following conclusions:

Safety

The ExSG assessed that the V-shaped plan could meet safety standards.

- The risk of exposure to communities would be minimized through primary flight routing that would avoid local communities and population centers as much as possible.
- With regard to air navigation safety concerns to the northeast associated with possible urbanization and community development, the primary orientation of routes over water would address those concerns better than Runway 05/23.
- Because of the primary orientation of routes over water, emergencies would most likely occur over water.
- The V-shaped configuration would provide a second runway that could be used in emergencies and would reduce the need to divert to alternate locations.

Operational Requirements

The ExSG assessed that the V-shaped configuration would meet U.S. forces operational requirements for wind alignment and throughput capacity:

- The orientation of the two runways would meet wind alignment design requirements.
- The V-shaped configuration would support both peacetime and contingency operational capacity requirements.

The ExSG assessed that the V-shaped configuration would meet the requirements for IFR capability, with one area of elevated operational risk that could be mitigated by use of the primary runway.

- Runways 05 and 07 (southwestern approaches) and 25 (northeastern approach) would meet both precision and non-precision instrument approach capabilities.

- Runway 23 (northeastern approach) would meet precision approach capability but would not provide for all non-precision approach capabilities due to proximity to mountainous terrain to the northeast. The TACtical Air Navigation approach would meet the operational capability requirement. The Airport Surveillance Radar (ASR) approach would not meet the operational requirement, resulting in an increased operational risk that could be mitigated with the option to land on Runway 25 when safety conditions prohibit landing on Runway 23.

Noise Impact and Effects on the Local Community

The ExSG performed its analysis of noise and local community impact for aircraft flying during both visual and instrument flight conditions. The ExSG noted that the V-shaped configuration was designed to reduce the noise and visual impact of overflight on local communities through the use of primary runways.

Based on this analysis, the ExSG confirmed that the V-shaped configuration would have the following impact on local communities with respect to noise and overflights.

- Under visual approach and departure conditions, the two runways would generally allow aircraft to take off and land without directly overflying communities to the northeast and southwest. Operations would generally be concentrated over water and away from population centers.
- Through the use of primary runways for instrument approach and departure, routing from and to the southwest could avoid overflying coastal communities. Approaches and departures from and to the northeast similarly could avoid overflying coastal communities.
- Use of primary runways in each direction would avoid overflights, reduce impact of noise on local communities, and mitigate the potential impact of possible urbanization and community development because operations would be concentrated over water.

Environmental Impact

According to the GOJ Draft Environmental Impact Statement, the V-shaped facility would be approximately 205 hectares in size and:

- Approximately 160 hectares of sea area would be reclaimed, requiring 21.0 million cubic meters of fill;
- Approximately 78.1 hectares of marine plants would be impacted; and,
- Approximately 6.9 hectares of coral would be impacted.

The existing beach on the east side of Camp Schwab would be lost due to reclamation, resulting in the loss of some animal and plant habitat.

THE "I" PLAN:

This plan for the replacement facility would consist of one runway in an I-shaped configuration (Graphic 5). The single runway would be oriented 05/23 but is sited approximately 200 meters farther down the peninsula than Runway 05/23 in the V-shaped configuration (Graphic 6). When winds are from the northeast, Runway 05 would be the arrival and departure runway (Graphic 7). When winds are from the southwest, Runway 23 would be the arrival and departure runway (Graphic 8). The ExSG refined and developed this plan over the course of several ExSG meetings, allowing for a detailed analysis against the aforementioned criteria, and reached the following conclusions.

Safety

The ExSG assessed that the I-shaped plan would meet safety standards.

- The risk of exposure to communities would be minimized through visual flight routing over water that would avoid local communities and population centers as much as possible.
- The risk of exposure to communities to the southwest would be minimized through instrument flight routing over water that would avoid local communities as much as possible.
- Instrument flight routing from the northeast could not avoid overflight of terrain, but would avoid current densely populated areas as much as possible.
- With regard to air navigation safety concerns associated with possible urbanization and community development, instrument flight routing from the northeast would overfly land.
- Emergencies during flights to and from the southwest would most likely occur over water. Emergencies during instrument flights to and from the northeast could occur over land or water.

Operational Requirements

The ExSG assessed that the I-shaped configuration would meet U.S. forces operational requirements for wind alignment and throughput capacity.

- The orientation of the runway would meet wind alignment design requirements.
- The I-shaped configuration would support both peacetime and contingency operational capacity requirements.

The ExSG assessed that the I-shaped configuration generally would meet the requirements for IFR capability, with one area of elevated operational risk.

- Runway 05 (southwestern approach) would meet both precision and non-precision instrument approach capabilities.

- Runway 23 (northeastern approach) would meet precision approach capability but would not meet all non-precision approach capabilities due to the proximity to mountainous terrain to the northeast. The TACtical Air Navigation approach would meet the operational capability requirement. The Airport Surveillance Radar (ASR) approach would not meet the operational requirement. This would result in an increased operational risk and could lead to diverts to alternate airfields.

Noise Impact and Effects on the Local Community

The ExSG performed its analysis of noise and local community impact for aircraft flying during both visual and instrument flight conditions. The ExSG noted that the I-shaped configuration was designed to reduce the noise and visual impact of overflight on the local community to the southwest through the positioning of the runway.

Based on this analysis, the ExSG assessed that the I-shaped configuration would have the following impact on local communities with respect to noise and overflights:

- Under visual approach and departure conditions, the runway would generally allow aircraft to take off and land without directly overflying communities to the northeast and southwest. Operations would generally be concentrated over water and away from population centers.
- During instrument approaches and departures, routing from and to the southwest could avoid overflying coastal communities. Approaches and departures from and to the northeast would result in overflying land.

Environmental Concerns

Using the methodology in the GOJ Draft Environmental Impact Statement, the I-shaped facility would be approximately 150 hectares in size and:

- Approximately 120 hectares of sea area would be reclaimed, requiring 18.9 million cubic meters of fill;
- Approximately 67.0 hectares of marine plants would be impacted; and,
- Approximately 5.5 hectares of coral would be impacted.

The existing beach on the east side of Camp Schwab would remain, but the impact on animal and plant habitat remains to be assessed.

SUMMARY:

During the course of several meetings, the ExSG carefully evaluated the advantages and disadvantages of the two plans. The ExSG assessed that either plan would meet land use compatibility standards. A land-use compatibility study, updated instrument approach capability study, air space study, and other technical studies would be necessary for either plan.

The ExSG assessed that there are differences between the two plans in safety, operational capabilities, noise impact and effects on local communities, environmental impact, construction timeline, and cost. The ExSG agreed that these differences must be carefully considered in making a final decision on a plan for the replacement facility.

Safety

- Both plans could meet safety standards.
- During visual flight conditions, routing for both plans would be primarily over water.
- Instrument flight routing to and from the northeast in the I-shaped plan would involve overflight of water and land while that in the V-shaped plan would involve overflight of water.
- With regard to air navigation safety concerns associated with possible urbanization and community development, instrument flight routing to and from the northeast would involve overflight of land in the I-shaped plan and overflight of water in the V-shaped plan.
- Emergencies during instrument flights to and from the northeast in the I-shaped plan would occur over land or water while those in the V-shaped plan would likely occur over water.

Operational Requirements

- Either plan would meet U.S. forces requirements for operational throughput and wind alignment, although the V-shaped configuration would provide a slightly broader range of wind coverage.
- The V-shaped configuration would meet the requirements for IFR capability, with one area of elevated operational risk that could be mitigated with the option to land on the primary runway.
- The I-shaped configuration generally would meet the requirements for IFR capability, with one area of elevated operational risk that could lead to diverts to alternate airfields.

Noise Impact and Effects on the Local Community

- The I-shaped configuration, during instrument approaches and departures from and to the northeast, would result in more overflight of land.

Environmental Concerns

- Using the methodology in the GOJ Draft Environmental Impact Statement, it was estimated that:

- The I-shaped plan would reclaim approximately 40 hectares less sea area and require approximately 2.1 million cubic meters less fill than that required for the V-shaped plan.
- Approximately 11.1 fewer hectares of marine plants could be impacted under the I-shaped plan.
- Approximately 1.4 fewer hectares of coral could be impacted under the I-plan.

- The ExSG considered the possible impact of the replacement facility plans on the dugong, based on the data of the current EIA procedures, and noted that the GOJ and the USG will continue to do so as part of the verification and validation process. It was determined that the GOJ and the USG will continue to carefully follow several mitigation measures to be implemented in the future based on the environmental preservation measures that have already been studied, and will conduct further discussions as necessary.

- The existing beach on the east side of Camp Schwab would remain under the I-shaped plan, but the impact on animal and plant habitat remains to be assessed.

Construction Timeline

- The ExSG was unable to determine the actual start date for construction for either plan. This is an issue requiring clarification during the verification and validation process to be completed by the time of the next SCC.
- The I-shaped plan would take approximately fifteen months longer to start construction than the existing V-shaped plan because the I-shaped plan would need a new design and modification of the EIA.
- The estimated construction period in the I-shaped plan would be approximately half a year shorter than the V-shaped plan mainly because of the smaller estimated sea area to be reclaimed.
- Therefore, the estimated completion point for the V-shaped plan would be approximately nine months earlier than the I-shaped plan.

Cost

- Although further study is required, the GOJ estimated that the construction cost of the I-shaped plan would be approximately three percent less than for the V-shaped plan, due to assumptions concerning the smaller estimated volume of landfill.

Graphic 1

The V Plan

Graphic 2


The V Plan
WIND FROM THE NORTHEAST
Oura
Mihara
Teima
Sedake
Kanucha Resort
Kayo
Hunami
Abu
Hanoko
Tovohara
Kushi
Matsuda
0
1km
2km
Graphic 3

The V Plan

Graphic 4

Graphic 5


The I Plan
Oura
Futami
Mihara
Teima
Sedake
Kanucha Resort
Kayo
Abu
Hanoko
Toyohara
Kushi
Matsuda
0
1km
2km

Graphic 6

The I Plan
WIND FROM THE NORTHEAST
Oura
Futami
Sedake
Mihara
Kanucha Resort
Kayo
Abu
Henoko
Toyohara
Kushi
Matsuda
0
1km
2km

Graphic 7


The I Plan
WIND FROM THE SOUTHWEST
Oura
Futami
Sedake
Teima
Minara
Kanucha Resort
Kayo
Abu
Henoko
Toyohara
Kushi
Matsuda
0
1km
2km
Graphic 8