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Information on the Progress of the Renovation of the King Sejong Korean Antarctic Station on King George Island, South Shetland Islands

Information on the Progress of the Renovation of the King Sejong Korean Antarctic Research Station on King George Island, South Shetland Islands

Background Paper submitted by the Republic of Korea

Summary

The King Sejong Station, operated by the Republic of Korea, was constructed in 1988 on the Barton Peninsula, King George Island, off the South Shetland Islands. Most of the research and summer accommodation facilities had been used for almost 30 years and were in need of repair and reconstruction. Renovations were required to not only address safety concerns of the outworn facilities, but also to further elevate the quality of research support.

The construction activities planned for 2016/17 season started in November 2016 and will finish on 9 April 2017. The removal of the old facilities and the replacement of the fuel tanks are now completed. The new two-story building containing research facilities and summer accommodation has almost been completed, except for some parts of electrical and interior works. The overall construction process will be 86% accomplished by the time when the construction personnel will be evacuated. All activities including cleaning up the site will be completed by December 2017. In order to minimize the environmental impact, mitigation measures were carried out throughout the entire period, in compliance with the Initial Environmental Evaluation (IEE) document for the renovation activities which had been endorsed by the Ministry of Foreign Affairs, Republic of Korea in September 2016.

Background

The King Sejong Station was constructed on the Barton Peninsula, on King George Island off the South Shetland Islands on Antarctica in 1988. Ever since, it has served to support a variety of research fields, such as oceanography, geophysics, geology, terrestrial and marine ecosystems studies.

Since its construction, certain facilities and buildings at the King Sejong Station underwent renovations at one point or another. However, most research and summer accommodation facilities were in use for almost 30 years, therefore in need of repair and reconstruction with some parts of the facility needing to be dismantled. The Republic of Korea decided to improve the conditions at the King Sejong Station and submitted a document (ATCM XXXIX IP 45) including a summarized IEE to inform the parties of the planned renovation activities.

Progress during the season 2016/17

Probationary fabrication in Korea before shipment

The new summer accommodation building of the King Sejong Station was pre-assembled in Korea in order to obtain effectiveness in construction and reduce waste in the Antarctic. Every step of the assembly was tested in Korea from May to July 2016.



Figure 1. Pre-assembling the summer accommodation building of the King Sejong Station in Korea.

Transportation

The cargo ship (*SHINSUNG EVER*) left Pyeongtaek Port in Korea with 9,180 m^3 of cargo and heavy vehicles on 26 September. The ship stopped in Punta Arenas in Chile for bunker and left the harbour on 19 November 2016. A total of 67 construction personnel were transported by a cruise ship from Ushuaia in Argentina or via air.

Unloading took about two weeks, from 23 November to 9 December, with a barge towed by a tug boat. The evacuation of 18 workers was achieved via air on 23 February, and the remaining personnel are planned evacuate with the icebreaker RV *ARAON* on 12 April, 2017.

Construction works

Temporary camp for construction crews was set up by reusing old buildings such as former laboratory and emergency modules which was scheduled to be demolished by the end of 2016/17 season. The removal of the old facilities and replacement of fuel tanks were completed. Solar panels (51.2 kW in total capacity) were installed on the roof of the new two-story building for research and summer accommodation. The building has been almost completed except parts of electrical and interior works. The overall construction process will be about 86% completed when the construction personal will be evacuated.

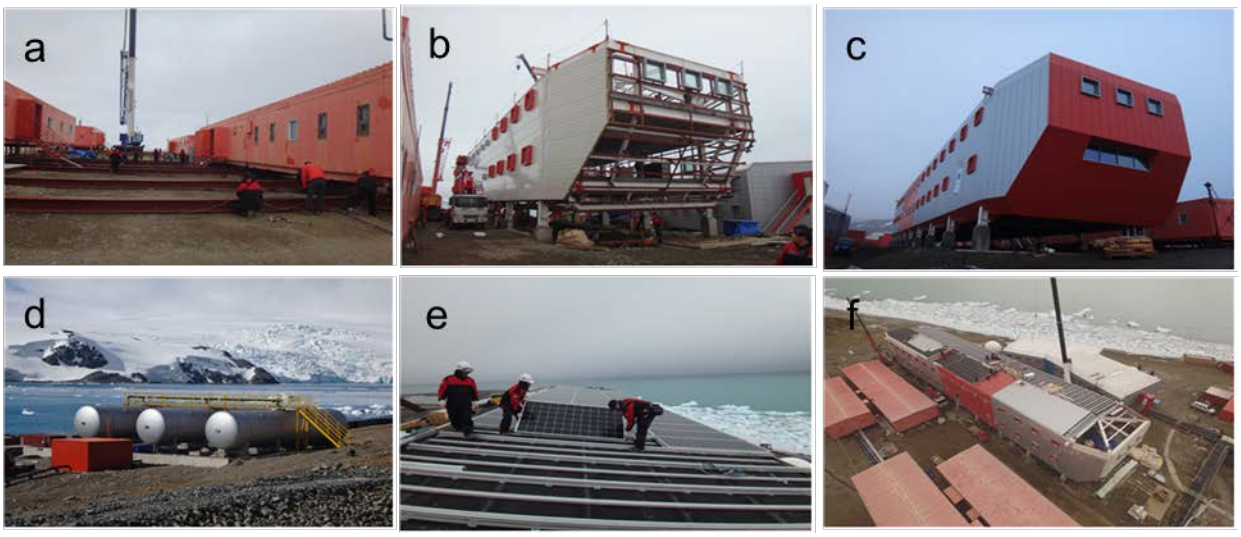

Figure 2. Construction activities in King Sejong Station. (a) Shifting the old buildings to reuse it as temporary modules. (b), (c). Two-story summer accommodation building. (d) Newly replaced double skinned fuel tanks. (e), (f). Installing solar panels on the roof.

Mitigation measures and environmental monitoring

In order to minimize the environmental impact, mitigation measures were taken throughout the renovation period, so that the process would comply with the Initial Environmental Evaluation (IEE) document for the renovation activities which had been endorsed by the Ministry of Foreign Affairs, Republic of Korea in September 2016.

Waste management

The waste produced during the construction work was managed according to the 'Korean Antarctic Station Waste Management Manual (KOPRI, revised 2015). The wastes were collected separately for recycling and reuse if possible. Waste storage was carefully handled in order to prevent wind dispersal and impact on environment. Fourteen 20ft ISO containers filled with waste, including reusable materials, were removed from the site by the cargo ship in April 2017. IC-SBR system was installed and operated to treat wastewater from construction crews independently.

Mitigating anthropogenic disturbance on flora and fauna

In order to minimise impact on skuas living near the station, the noise level was kept under 60 dB around the construction site, and to avoid the disturbance to the nest, visiting by personnel was restricted. As there were no major habitats of flora in the vicinity of the station, we could avoid adverse impact on flora.

Environmental monitoring

As the renovation work continues, Korea Polar Research Institute will carry on with its ongoing monitoring of environmental impacts from the reconstruction. We will continue our efforts to minimize the environmental impacts from the operations of our stations and to put our efforts to improve our operations to that effect.

Outlook in the following season 2017/18

The second phase of renovation work will start in the early November and be finished by December, 2017. The remaining electrical, mechanical and interior works will be completed in the following season and all construction wastes will be removed from the Antarctic area after the completion of the renovation.

Figure 3. Aerial view of the King Sejong Station during the first renovation phase (on 1 March, 2017).