

Annex H

Investigation Report

Annex H1

Investigation Report - 3i bY2020

Investigation Report of CEMS Exceedances

Date	1 – 30 June 2020
Time	Continuous monitoring throughout June 2020
Monitoring Location	Continuous Environmental Monitoring System (CEMS)
Parameter	Various emission parameters of the Cogeneration Unit (CHP) and Ammonia Stripping Plan (ASP)
Exceedance Description	<ol style="list-style-type: none"> Continuous monitoring was carried out at the CAPCS, CHP and ASP throughout the reporting period using the CEMS. According to the EM&A Manual, exceedance is considered if the emission concentration of the concerned pollutants is higher than the emission limits stated in Tables 2.2, 2.3 and 2.5 of the EM&A Manual (Version F) for CAPCS, CHP and ASP respectively. The concentration of the concerned air pollutants were monitored on-line by the CEMS. Exceedances of various emission parameters were recorded on the CEMS including: <ul style="list-style-type: none"> SO₂ and NO_x in the CHP Carbon Monoxide, NO_x VOCs (including methane) and NH₃ in the ASP. According to the Contractor, the plant was receiving around 100 tonnes of SSOW daily and was operated normally. The Contractor explained that the exceedances recorded in the ASP was because the thermal combustion unit of the ASP still require tuning to optimise the combustion efficiency.
Action Taken / Action to be Taken	<ul style="list-style-type: none"> It was arranged with the supplier of CHPs to check the performance of the stacks onsite during the reporting period. The supplier conducted a detailed investigation of the remaining exceedance recorded on the CHPs. After the investigation, the Contractor will perform the maintenance work according to suggestions raised by the supplier. Parts of the modification works on the ASP has been completed, with more components waiting to be delivered to Hong Kong. The Contractor has scheduled the remaining modification work for the next few reporting periods with schedule shutdown of the ASP to facilitate the installation of equipment for performance optimisation. However, the supplier could not travel to Hong Kong due to the restrictive travel arrangement during this reporting period. The modification work will continue once the supplier is able to travel to Hong Kong.
Remedial Works and Follow-up Actions	The Contractor is recommended to closely monitor the processes, including the modification work and follow-up

	emission monitoring of the ASP to avoid exceedance. MT will carry out follow-up audit regarding the progress next month.
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Prepared by: Bonia Leung, MT Representative

Date 6 July 2020

Annex H2

Investigation Report - 31 `m2020

Investigation Report of CEMS Exceedances

Date	1 - 31 July 2020
Time	Continuous monitoring throughout July 2020
Monitoring Location	Continuous Environmental Monitoring System (CEMS)
Parameter	Various emission parameters of the Cogeneration Unit (CHP) and Ammonia Stripping Plan (ASP)
Exceedance Description	<p>1. Continuous monitoring was carried out at the CAPCS, CHP and ASP throughout the reporting period using the CEMS. According to the EM&A Manual, exceedance is considered if the emission concentration of the concerned pollutants is higher than the emission limits stated in Tables 2.2, 2.3 and 2.5 of the EM&A Manual (Version F) for CAPCS, CHP and ASP respectively. The concentration of the concerned air pollutants were monitored on-line by the CEMS. Exceedances of various emission parameters were recorded on the CEMS including:</p> <ul style="list-style-type: none"> • Odour (including NH₃ and H₂S) in the CAPCS • SO₂ and NO_x in the CHP • Carbon Monoxide, NO_x, SO₂, VOCs (including methane), NH₃, HCL and HF in the ASP. <p>2. According to the Contractor, the plant was receiving around 100 tonnes of SSOW daily and was operated normally.</p> <p>3. The Contractor explained that the exceedances recorded in the ASP was because the thermal combustion unit of the ASP still require tuning to optimise the combustion efficiency.</p>
Action Taken / Action to be Taken	<ul style="list-style-type: none"> • CAPCS was undergoing system maintenance during the report period which results in the fluctuation in readings. The supplier will monitor the CAPCS to improve the performance in the next reporting period. • It was arranged with the supplier of CHPs to check the performance of the stacks onsite during the reporting period. The supplier will conduct a detailed investigation of the remaining exceedance recorded on the CHPs. After the investigation, the Contractor will perform the maintenance work according to suggestions raised by the supplier. • Parts of the modification works on the ASP has been completed, with more components waiting to be delivered to Hong Kong. The Contractor has scheduled the remaining modification work for the next few reporting periods with schedule shutdown of the ASP to facilitate the installation of equipment for performance optimisation. However, the supplier could not travel to Hong Kong due to the restrictive

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	travel arrangement during this reporting period. The modification work will continue once the supplier is able to travel to Hong Kong.
Remedial Works and Follow-up Actions	The Contractor is recommended to closely monitor the processes, including the modification work and follow-up emission monitoring of the ASP to avoid exceedance. MT will carry out follow-up audit regarding the progress next month.

Prepared by: Bonia Leung, MT Representative

Date 7 August 2020

Annex H3

Investigation Report - 5i [i gh2020

Investigation Report of CEMS Exceedances

Date	1 - 31 August 2020
Time	Continuous monitoring throughout August 2020
Monitoring Location	Continuous Environmental Monitoring System (CEMS)
Parameter	Various emission parameters of the Cogeneration Unit (CHP) and Ammonia Stripping Plan (ASP)
Exceedance Description	<ol style="list-style-type: none"> 1. Continuous monitoring was carried out at the CAPCS, CHP and ASP throughout the reporting period using the CEMS. According to the EM&A Manual, exceedance is considered if the emission concentration of the concerned pollutants is higher than the emission limits stated in Tables 2.2, 2.3 and 2.5 of the EM&A Manual (Version F) for CAPCS, CHP and ASP respectively. The concentration of the concerned air pollutants were monitored on-line by the CEMS. Exceedances of various emission parameters were recorded on the CEMS including: <ul style="list-style-type: none"> • NO_x in the CHP • NO_x and NH₃ in the ASP. 2. According to the Contractor, the plant was receiving around 100 tonnes of SSOW daily and was operated normally. 3. The Contractor explained that exceedances recorded in the CHP was due to the low biogas loading which results in the poor performance efficiency in CHP. Exceedances in ASP was caused by unstable column temperature in biogas combustion
Action Taken / Action to be Taken	<ul style="list-style-type: none"> • CHP improvement was conducted in previous reporting periods, including tuning equipment set points, changing filters and cleaning of equipment components. Supplier was arranged to perform fine-tuning of equipment on-site. The Contractor will continue to monitor the emission of CHP and avoid the running of CHPs when biogas loading is lower than optimal performance efficiency in order to prevent further exceedances. • Parts of the modification works were completed in previous reporting periods, including the installation of the air blast cooler and the heat exchanger. These equipment aim to stabilise the temperature of the ASP column to allow complete combustion of biogas in the ASP. Column stripping and packing cleaning were performed in this reporting period to maintain operation efficiency. For the remaining exceedances, it was arranged with the supplier of ASP to check the performance of the stacks onsite. However the supplier could not travel to Hong Kong during this

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	reporting period due to restrictive travel arrangement. Communication with supplier was maintained and fine-tuning of equipment was performed according to supplier's instructions. The Contractor continues to carry out maintenance measures as per the supplier's manual.
Remedial Works and Follow-up Actions	The Contractor is recommended to closely monitor the processes, including the modification work and follow-up emission monitoring of the CHP and ASP to avoid exceedance. MT will carry out follow-up audit regarding the progress next month.

Prepared by: Bonia Leung, MT Representative

Date 9 September 2020