



GALAXY ENERGY SOLUTIONS LLP

THE SAVING ANALYSIS REPORT

PRODUCT:



COMPANY:



SITE:

The Roseate, New Delhi
Samalka, NH-8, New Delhi, Delhi 11
India

DATE:

6th March 2017

The Roseate, New Delhi



Premium property of the esteemed Bird Group Hospitality,
Nestled in 3.2 hectares of landscaped gardens

Executive Summary

The report presents saving analysis for the usage of Hydromx (30thApril, 2017), a heat transfer fluid, in two Thermax Hot Water Generators each of 2 lakh kcal, installed at the Hotel- The Roseate-New Delhi. This facility is part of their service units that is meant to provide hot water to the room inmates and related auxiliary services.

Highlights:

890 Litres

HSD SAVED IN 30 days

INR 53400

Amount SAVED IN 30 days

<12 Months

ROI

30.6%

Increase in Hot water generation per Litre HSD consumption

For a better understanding of the data, observations are divided in three different durations so that an over all pattern of saving vis a vis changes in consumption can be outlined.

33 DAYS READINGS RESULTS:

886.83	Litre HSD SAVED	in 30 days
53209.61	Amount SAVED	in 30 days
30.9%	Increase in Hot water generation per Litre HSD consumption	

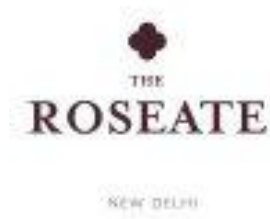
35 DAYS READINGS RESULTS:

916.97	HSD SAVED	in 30 days
55018.11	Amount SAVED	in 30 days
30.9%	Increase in Hot water generation per Litre HSD consumption	

56 DAYS READINGS RESULTS:

889.22	HSD SAVED	in 30 days
53352.92	Amount SAVED	in 30 days
30.6%	Increase in Hot water generation per Litre HSD consumption	

Thus, the application of Hydromx, as heat transfer fluid, has reduced HSD consumption, reduced boiler run-time along with improvement in the system performancer under similar conditions of system operation.



Hotel details

INTRODUCTION:

HOTEL CHAIN: The Roseate, New Delhi
Premium Property Of
THE ESTEEMED BIRD GROUP HOSPITALITY
Bird Group is a well-known name in the hospitality sector

Location: 4.5 km from Indira Gandhi International Airport,
11 km from Chhatarpur Temple.

Ideally located near New Delhi's business centre, embassy area, luxury malls, historical sites and airport, the hotel is also within easy reach of the corporate hub of Gurgaon this premium hotel nestled in 3.2 hectares of landscaped gardens

Address: Samalka, NH-8, New Delhi,
Delhi 110037

Phone: 011 3355 2211

The Roseate, New Delhi:

The reception



Refreshing greenery & tranquil water-bodies

It is a one-of-its-kind urban resort with eight acres of refreshing greenery & tranquil water-bodies blend seamlessly with award winning architecture. Thus, it provides perfect escape from the tediousness of city life.

The Roseate New Delhi offers a transcendental 5-star leisure experience in the heart of New Delhi, India. Nestled amongst groves of trees and surrounded by beautiful green landscaping, The Roseate New Delhi provides the ultimate urban resort experience, perfectly blending modern convenience and timeless natural beauty.



THE NEED:

Given the impact of energy efficiency on consumers' energy bills more is needed to make energy systems more efficient and sustainable. This can be done through the integration of products that can enhance heat transfer capability and thus increase energy efficiency and cost savings. The improvement in energy efficiency will also have its impact on reducing carbon emission, a need of national as well as global importance.

THE SOLUTION: **HYDROMX** - an energy saving fluid

Hydromx when used with water in the ratio of 50:50 enhances the capacity of water to transfer heat. Thus, makes it more efficient in terms of energy consumption.

PRODUCT: **HYDROMX** - AN ENERGY SAVING FLUID

Hydromx is a patented energy saving, advanced heat transfer fluid that makes use of nano-thermo technology to enhance the energy efficiency of closed loop hydronic systems.

Hydromx uses nano-particles to increase the speed of energy transfer, by cooling / heating up the fluid and transferring the energy in a shorter amount of time, thereby requiring significantly less energy. It is used with water (Hydromx : water as 50:50).

GALAXY ENERGY SOLUTIONS LLP, (GES)

is the exclusive distributor in India for

Hydromx : an Energy saving Solution

Table: Multiple Benefits of Hydromx

One Solution - Many Solutions				
Features	Water	Chemical Inhibitor	Antifreeze	
Energy Saving Up To 35%	X	X	X	✓
System Protection	X	✓	X	✓
Freezing Protection	X	X	✓	✓
Bacteria, Corrosion, Calcification	X	✓	X	✓

Hydromx provides great benefits on environmental impacts calculated when compared to brine/water and ethylene glycol systems due to energy savings achieved during the use phase.

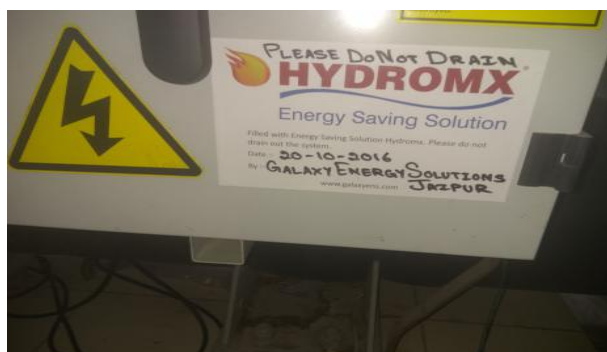
The Hydromx provides the multiple benefits mentioned in the table given above; in addition to the fact that it is a better heat transfer medium in comparison to water.

Hydromx is best suited for closed loop heating and cooling systems. The efficiency of the system increases due to diminishing run-time of associated equipments. Hence drastic increase in equipment life is achieved along with lesser maintenance cost.

Hydromx when used with water in the ratio of 50:50 enhances the capacity of water to transfer heat. Thus, makes it more efficient in terms of energy consumption.

Additional Advantages:

- *Anti-corrosive and Anti-calcification:* protects the system from corrosion and scaling; thereby life cycle increases
- *Anti-freeze:* protects the system against freezing
- *Faster heat removal:* This will keep CNC head at lower temperature during its working, thereby reducing wear & tear of the unit.
- *Life cycle:* Thus product has 15-20 years life cycle for its 1st use.
- *No shut down is required:* The equipment does not need any frequent shut-downs for dosing of inhibitors, which were otherwise happening when water was used as heat transfer medium.
- *No inhibitor is required:* Hydromx itself also acts as an inhibitor.
- *No retrofit is required:* Hydromx can be used in the system without any rectification or modification in the equipments.
- *Can be reused again and again:* Hydromx used in one system can be reused / transferred on another system, if required.
- This product is ready for reuse after its life cycle by processing it through recycling.



Safety Instruction at Site:

Please Don't Drain Hydromx

This is because the expected life of the product is around 15 years

BACKGROUND

It was agreed between The Roseate, New Delhi and Galaxy Energy Saving Solutions LLP (exclusive distributor of Hydromx in India), that Hydromx will be installed in room heating system at premier luxury hotel The Roseate, New Delhi. Data of both water (before upgrade) and Hydromx will be recorded on set parameters through a data logging device to fairly assess the changes brought about by Hydromx in the efficiency and the operation of the system. The aim was to set an example by saving energy in heat pump and make a case study out of it.

DOCUMENTATION

The document reports on the findings and data analysis relating to the performance data from the Boiler unit, which is providing heating effect to the water supply to the rooms at various floors of The Roseate, New Delhi. This report specifically investigates the performance data trends, (temperature and electricity consumption) before and after installation of Hydromx, with an overall aim of delivering a view of the system's performance.

The data provided had been monitored and acquired through data logger in two stages,

- i.e.
1. Before Hydromx was installed, and
 2. After the Hydromx was installed.

The raw data has been collected upon installation of data logger in consultation with the The Roseate, New Delhi authorities concerned.

The Study - Energy Savings

To prove the energy savings delivered by Hydromx , the necessary data loggers were installed to log the data for utilisation of both boiler units. Thermocouples were installed to measure the temperature of the fluid entering and leaving the system.

1st set: Data relating to heating load with water as heat transfer fluid

2nd set: Data relating to heating load with Hydromx as heat transfer fluid

The two ECOFLAM Hot Water Generating units each with a capacity of 2 lakh kcal and system capacity of 1000 litre are installed by The Roseate, New Delhi for hot water supply to facilitate their hospitality for premium rooms, suites, and world renowned

restaurants and other similar requirements. The utility tank has a capacity 10,000 litres. Initially, data collection was done with water as the heat transfer fluid from January 5, 2017 to March 5, 2016. Thereafter, from March 6, 2017 onwards, the same system (with heat transfer fluid capacity of 1000 litres) was installed with 460 litre Hydromx mixed with 540 litres of water for performance testing.



Boiler units at Hotel Roseate



Make-up Tank at Hotel Roseate



PHE system at Hotel Roseate

RESULTS & OBSERVATIONS:

The summarized data are presented in the tables as well as graphically to understand the impact of Hydromx in terms of savings achieved by using Hydromx in place of water. The comparison has been made for similar conditions and similar duration of operation of the system. The results shows savings are achieved directly in terms of amount saved by saving in consumption of Hydromx, reduction in boiler run-time and achieving higher quantity of hot water generation.

DATA ANALYSIS BETWEEN WATER AND HYDROMX : DURATION 33 DAYS

	1 FEB. TO 5 MARCH 2017	6 MARCH TO 7 APRIL 2017
	WATER	HYDROMX
NO. OF DAYS	33	33
RUN TIME	398.83	225.5
HSD	5583	3157
S.TEMP	67.35	68.8
R.TEMP	59.9	60.7
DELTA	7.45	8.1
MIXING TANK(BASE TEMP=37 C	45.9	45.88
WATER CONSUMPTION	522700	386900
AMBIENT	26.6	27
HSD/ PER HR	14.00	14.00
HOTWATER GENERATION	93.62	122.55
HEATING K CAL	168966.0	183708.0
PER DAY RUN TIME	12.1	6.8

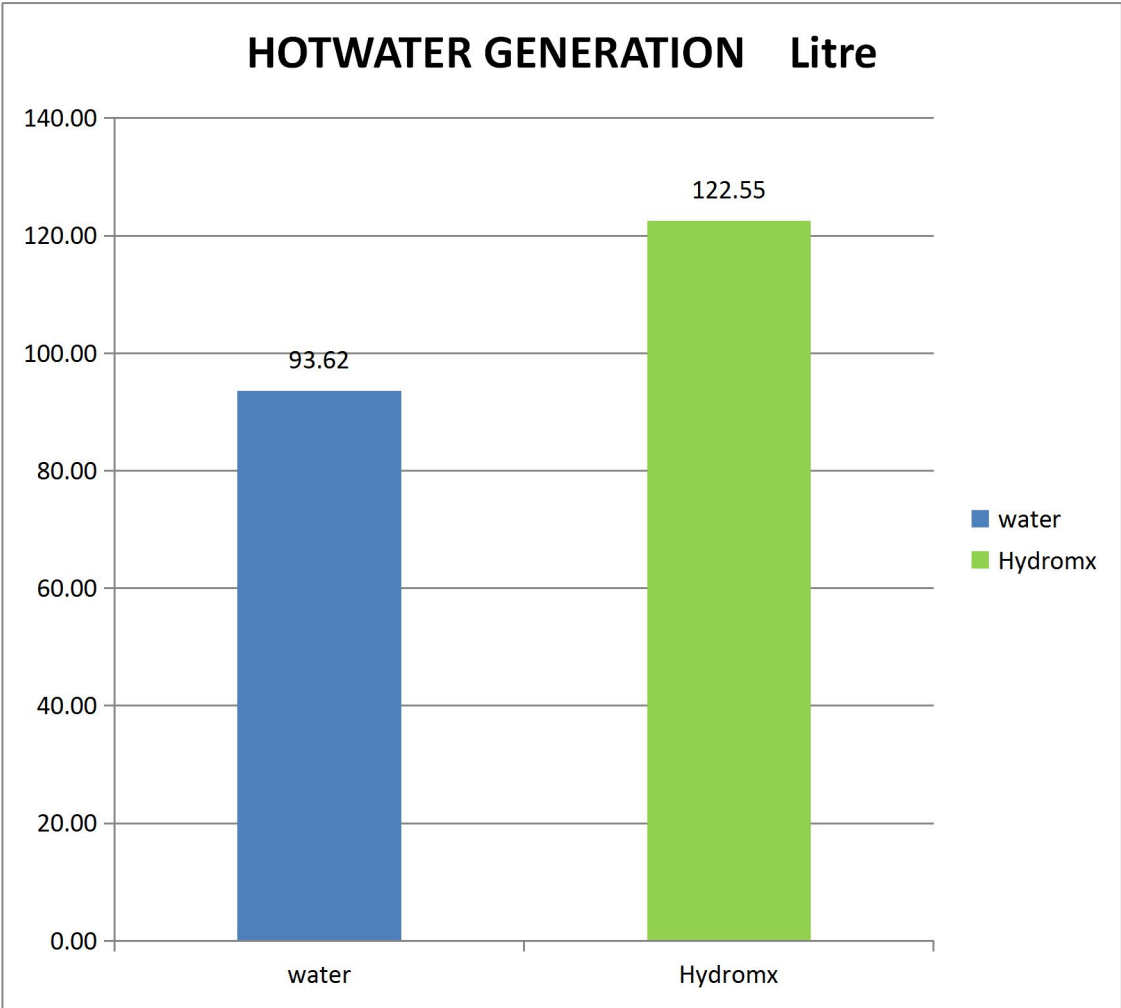
CONSUMPTION OF HSD IF RUNNING ON WATER (386900/93.62)	4132.51
ACTUAL CONSUMPTION OF HSD ON HYDROMX	3157
SAVING OF HSD IN 33 DAYS	975.51

SAVING IN PERCENTAGE	30.90%
----------------------	--------

TOTAL HSD SAVED IN 33 DAYS	975.51
HSD SAVED PER DAY Litre	29.56
HSD SAVED N 30 DAYS Litre	886.83
AMT. SAVED IN 30 DAYS INR	53209.60746

Graphical Display:

HOTWATER GENERATION per Litre HSD consumption
DURATION 33 DAYS



DATA ANALYSIS BETWEEN WATER AND HYDROMX : DURATION 35 DAYS

	30 JAN. TO 5 MARCH 2017	6 MARCH TO 9 APRIL. 2017
	WATER	HYDROMX
NO. OF DAYS	35	35
RUN TIME	423.7	239.5
HSD	5932	3353
S.TEMP	67.35	68.8
R.TEMP	59.9	60.7
DELTA	7.41	7.84
MIXING TANK(BASE TEMP=37 C	45.9	45.88
WATER CONSUMPTION	546150	407200
HSD/ PER HR	14.00	14.00
HOTWATER GENERATION	92.07	121.44
HEATING K CAL	168058.8	177811.2
PER DAY RUN TIME	12.1	6.8

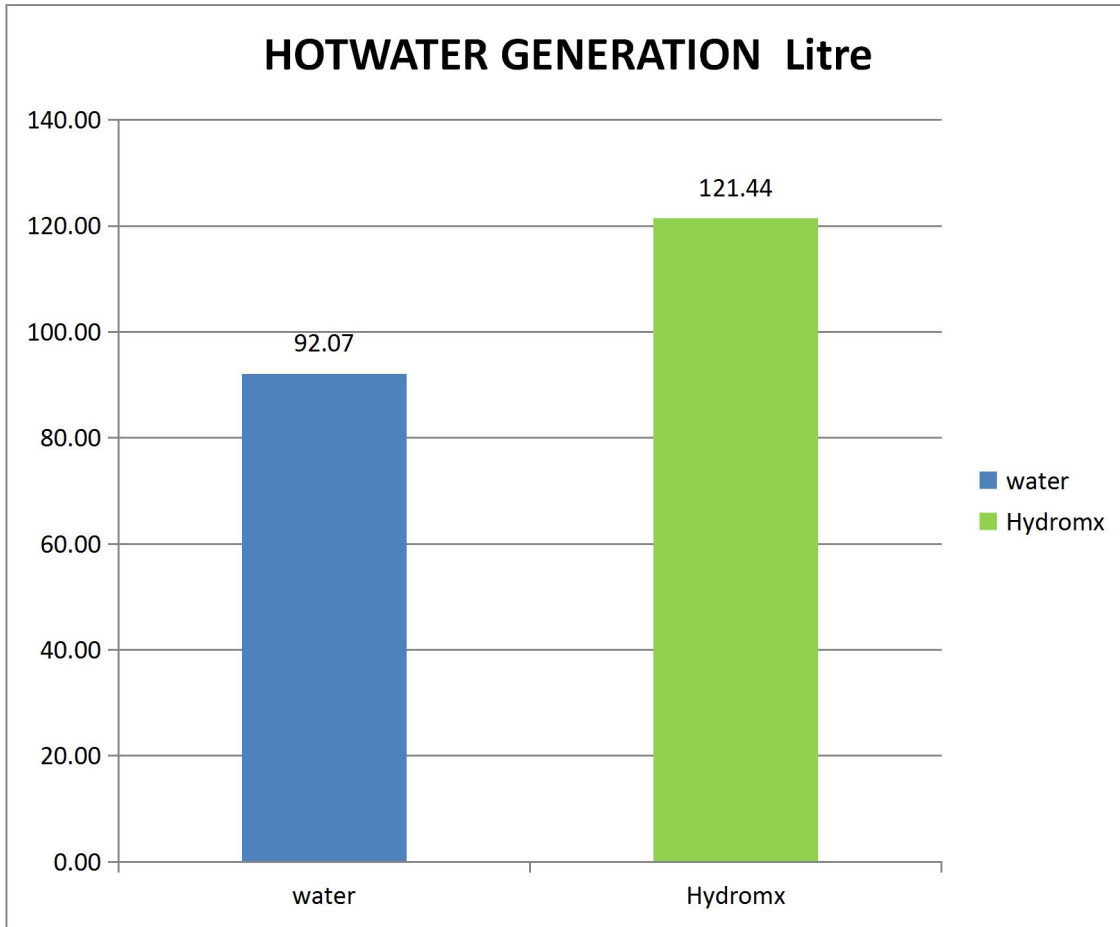
CONSUMPTION OF HSD IF RUNNING ON WATER (407200/92.07)	4422.80
ACTUAL CONSUMPTION OF HSD ON HYDROMX	3353
SAVING OF HSD IN 35 DAYS	1069.80
SAVING IN PERCENTAGE	31.91%

TOTAL HSD SAVED IN 35 DAYS	1069.80
HSD SAVED PER DAY Litre	30.57
HSD SAVED IN 30 DAYS Litre	916.97
AMT. SAVED IN 30 DAYS INR	55018.11433

Graphical Display:

HOTWATER GENERATION per Litre HSD consumption

DURATION 35 DAYS



DATA ANALYSIS BETWEEN WATER AND HYDROMX : DURATION 56 DAYS

	20 JAN. TO 5 MARCH 2017	6 MARCH TO 30 APRIL. 2017
	WATER	HYDROMX
NO. OF DAYS	45	56
RUN TIME	590.5	388
HSD	8269	5429.5
S.TEMP	67.35	68
R.TEMP	59.9	60.5
DELTA	7.45	7.5
MIXING TANK(BASE TEMP=37 C	45.9	45.88
WATER CONSUMPTION	685490	587700
HSD/ PER HR	14.00	13.99
HOTWATER GENERATION	82.90	108.24
HEATING K CAL	168966.0	170100.0
PER DAY RUN TIME	13.1	6.9

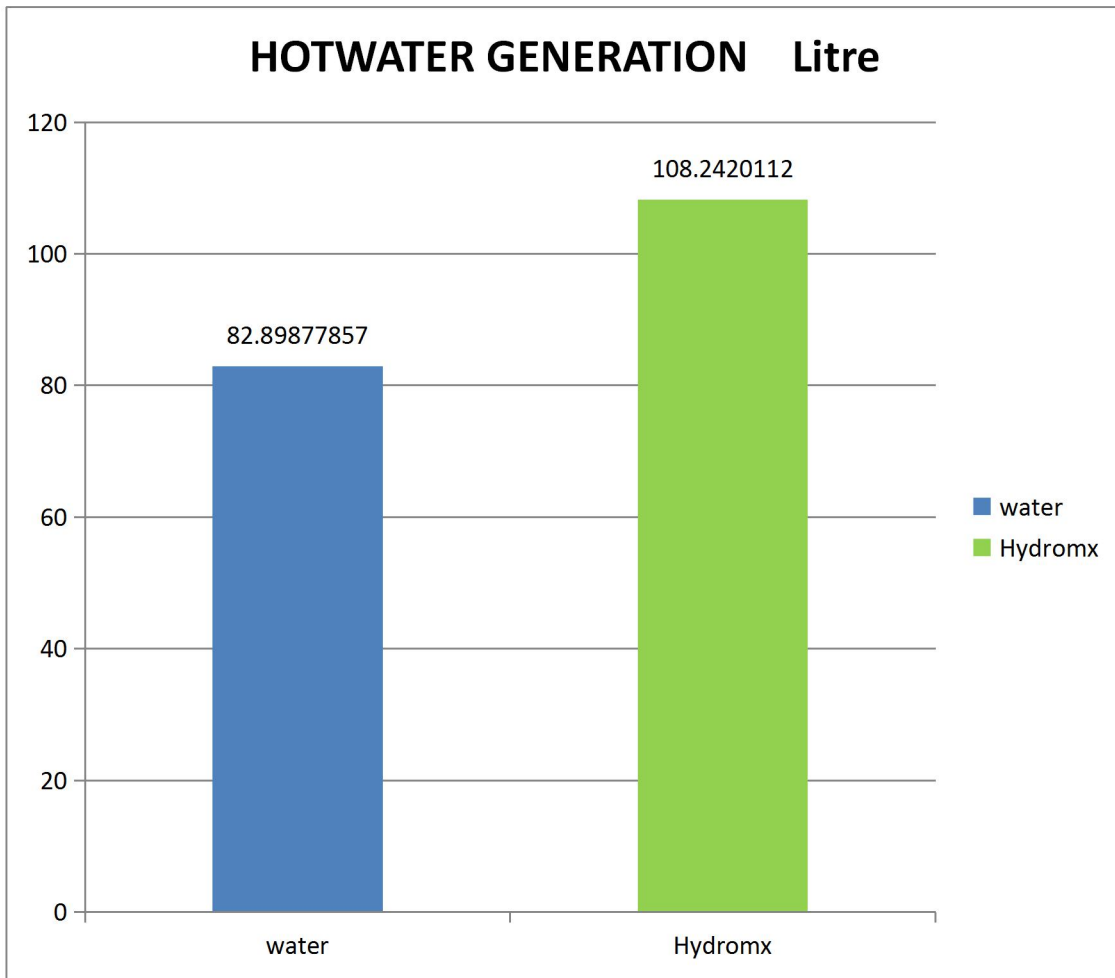
CONSUMPTION OF HSD IF RUNNING ON WATER (587700/82.90)	7089.37
ACTUAL CONSUMPTION OF HSD ON HYDROMX	5429.5
SAVING OF HSD IN 56 DAYS	1659.87
SAVING IN PERCENTAGE	30.57%

TOTAL HSD SAVED IN 56 DAYS	1659.87
HSD SAVED PER DAY Litre	29.64
HSD SAVED IN 30 DAYS Litre	889.22
AMT. SAVED INR IN 30 DAYS	53352.92015

Graphical Display:

HOTWATER GENERATION per Litre HSD consumption

DURATION 56 DAYS



SUMMARY DATA:

S. No.	Item		33 days basis	35 days basis	56 days basis
1	HSD SAVED IN 30 DAYS	Litre	886.83	916.97	889.22
2	AMT. SAVED IN 30 DAYS	INR	53209.61	55018.11	53352.92
4	INCREASE IN HOT WATER GENERATION	Litre	30.9%	31.9%	30.6%

Highlights:

890 Liters HSD SAVED IN 30 days

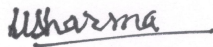
INR 53400 Amount SAVED IN 30 days

<12 Months Return on Investment

30.6% Increase in Hot water generation per Litre HSD consumption

CONCLUSION:

1. The results indicated are for the same durations, except 56 days period, while using water and Hydromx in the system.
2. HSD Consumption has reduced by 890 litre (887 to 917 liters) for a period of 30 days while using Hydromx as medium of heat transfer vs. water
3. INR 53400.00 is saved for a period of 30 days (HSD @ INR 60.00 per litre)
4. Hot water generation has increased more than 30% for the same duration by using Hydromx as a medium of heat transfer in place of water
5. ROI for Hydromx is less than 12 months


Dr. K.C. Sharma
Fellow: FIE, ISTE, SAE
B.E.(Mech.), M.Tech.(IIT Mumbai)
Ph.D., UNQC-QIP (Japan)