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Mission Planning for Two Years Normal Operation of COMS

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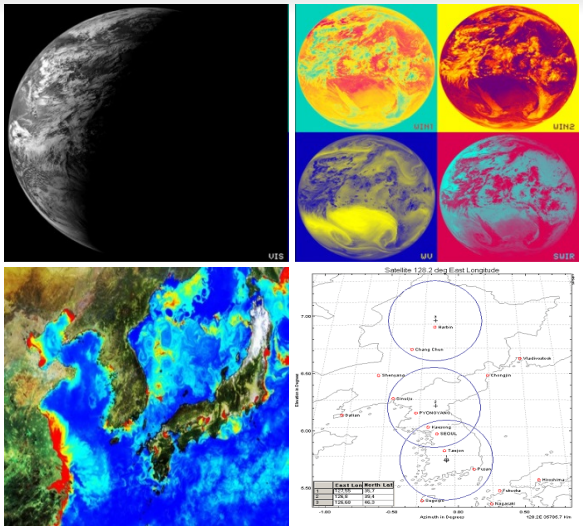
Introduction to COMS



Operational life: 7 years from launch

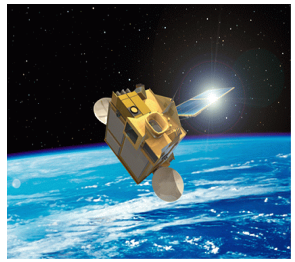
Launch Date: June 27, 2010

Orbit Location: 128.2°E @GEO

Mission: Meteorological Observation

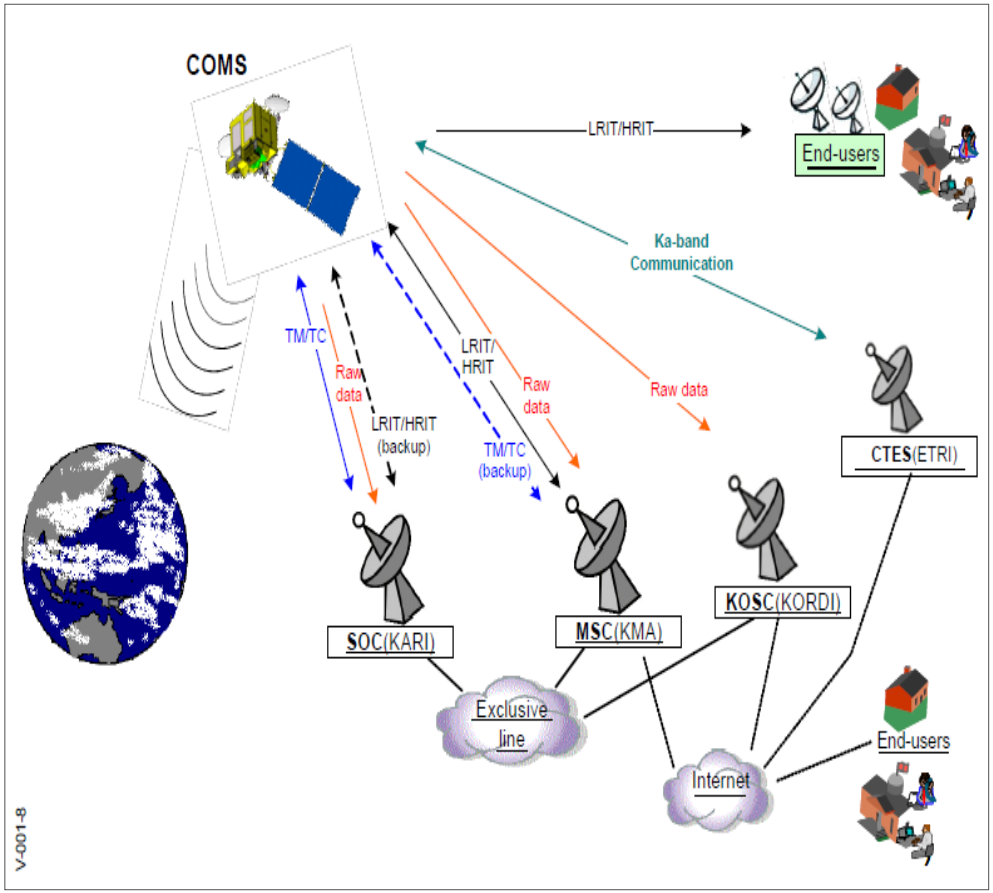
Ocean Color Monitoring

Telecommunication Service



Ground Stations of COMS

❖ Satellite Ground Control System(SGCS) of Satellite Operation Center(SOC) is located at the Korea Aerospace Research Institute(KARI).



[figure1. the ground station of the COMS]

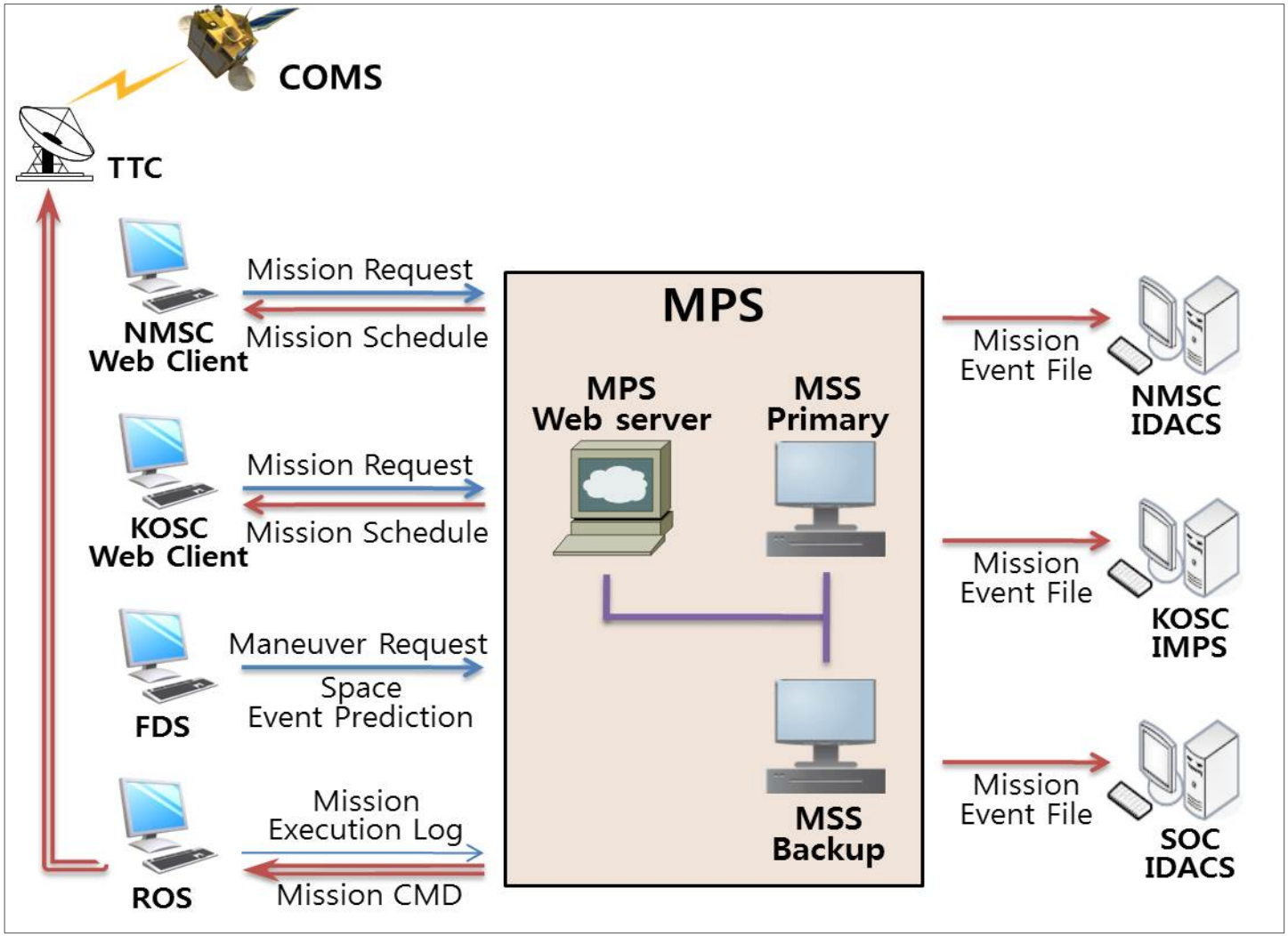
Main Parts:

- Flight Dynamic Subsystem(FDS)
- Mission Planning Subsystem(MPS)
- Real-Time Operation Subsystem(ROS)
- Telemetry, Tracking & Command(TT&C)

Ancillary Parts:

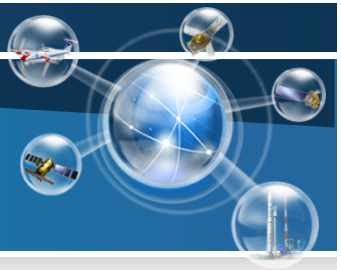
- Dynamic Satellite Simulator System(DSSS)
- Operation Training Subsystem(OPTS)
- COMS View

Configuration of MPS



[figure2. the configuration of MPS]

Daily Mission Planning(1/2)

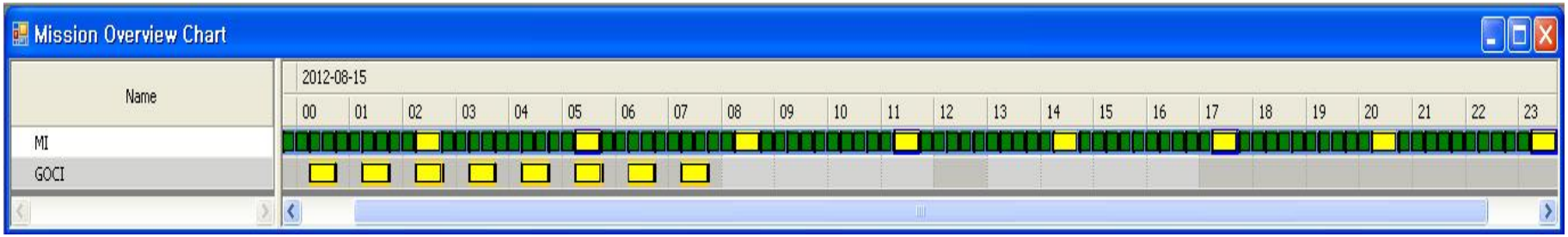


- **Meteorological observation**
  - continuous monitoring of imagery and extracting of meteorological products
  - early detection of special weather
  - extraction of change of sea surface temperature and cloud
  - comprised of the combined global mode(FD+LA) and regional modes(ENH+LA+ENH+LA)

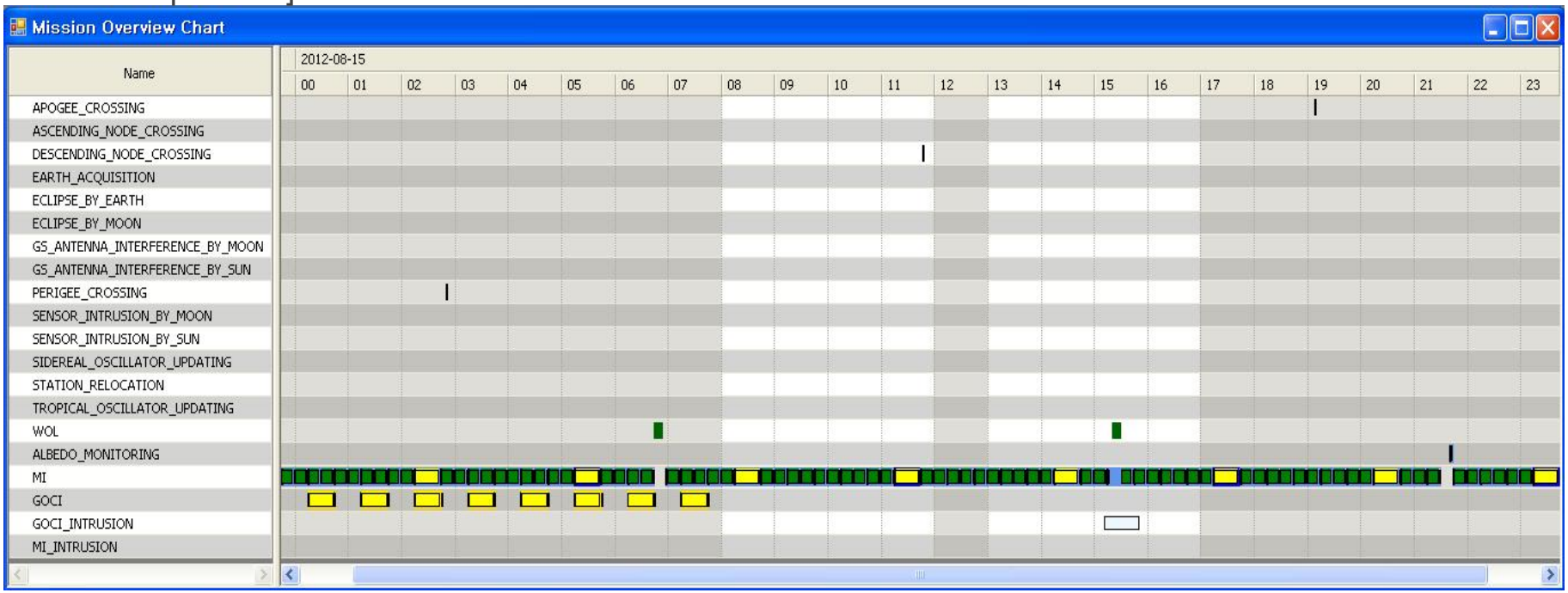
- **Ocean monitoring**
  - monitoring of marine environments around Korean peninsula
  - monitoring of change of marine ecosystem
  - performed one time every hour from 00:15(UTC) to have 8 times observations

- **Wheel Off Loading(WOL) maneuver**
  - to maintain satellite attitude
  - performed twice a day
  - it has three optimal times close to 00h, 06h, 15h (UTC)

Daily Mission Planning(2/2)



[figure3. A daily mission request of the Earth observation for the COMS normal operation]

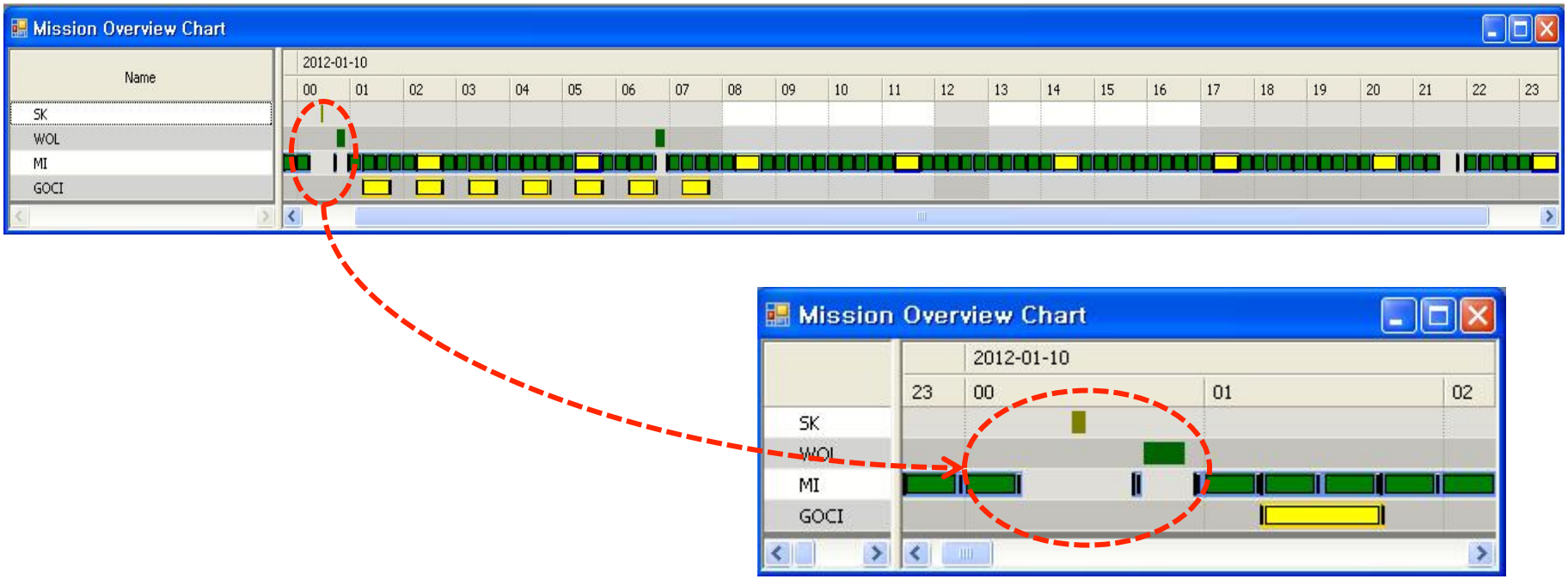


[figure4. A daily mission schedule of the Earth observation for the COMS normal operation]

Weekly Mission Planning

- **Station Keeping(SK) maneuver**

- to maintain satellite orbit
- North-South(NS) and East-West(EW) station keeping performed once a week, respectively



[figure5. A weekly mission schedule of the Earth observation for the COMS normal operation (NSSK)]

Monthly Mission Planning(1/2)

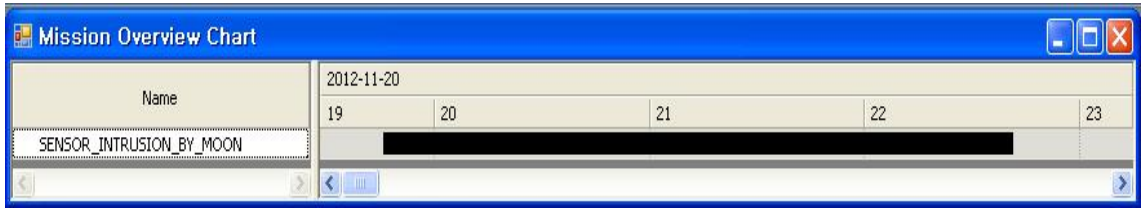
▪ Oscillator update

- to update the sidereal & tropical oscillators to account for the SCU clock drift
- performed every 4 weeks

[figure6. A monthly mission schedule of the Earth observation for the COMS normal operation (Oscillator)]

▪ IRES Moon Blinding table update

- to send the Moon masking time and area data to the satellite
- performed every month

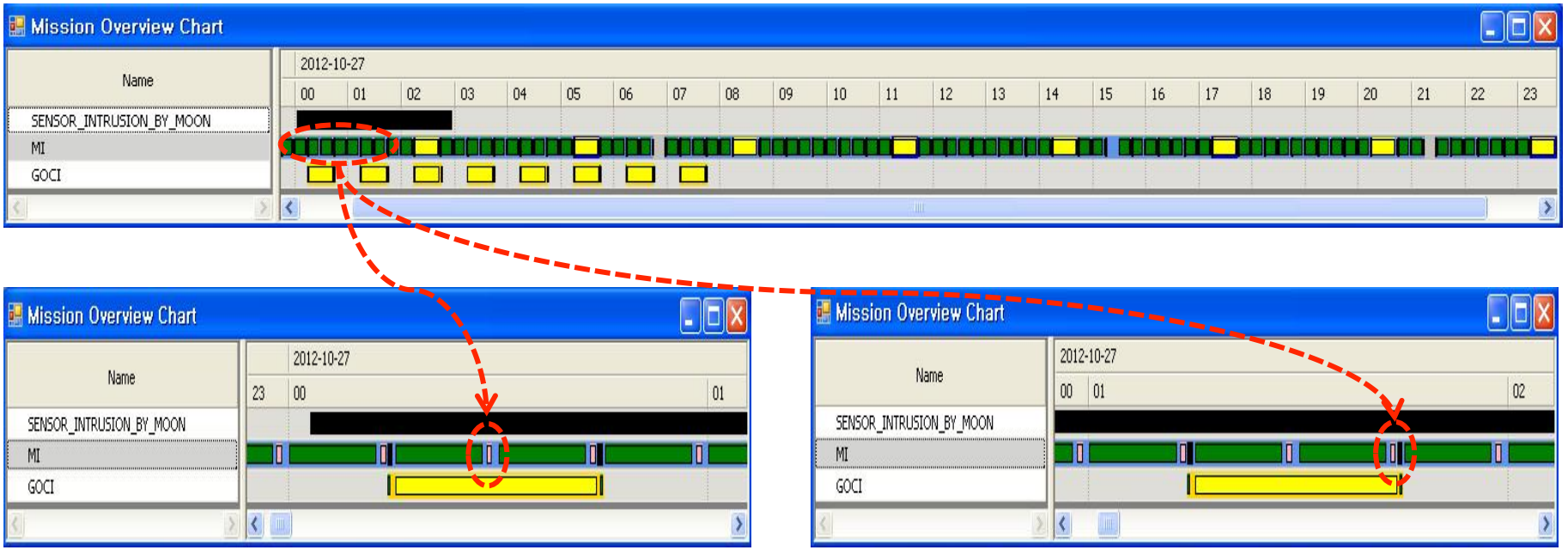


[figure7. A monthly mission schedule of the Earth observation for the COMS normal operation (IRES MOON Blinding)]

Monthly Mission Planning(2/2)

- **Moon Imaging**

- to monitor radiometric performance variation of the MI visible channel
- taken every month

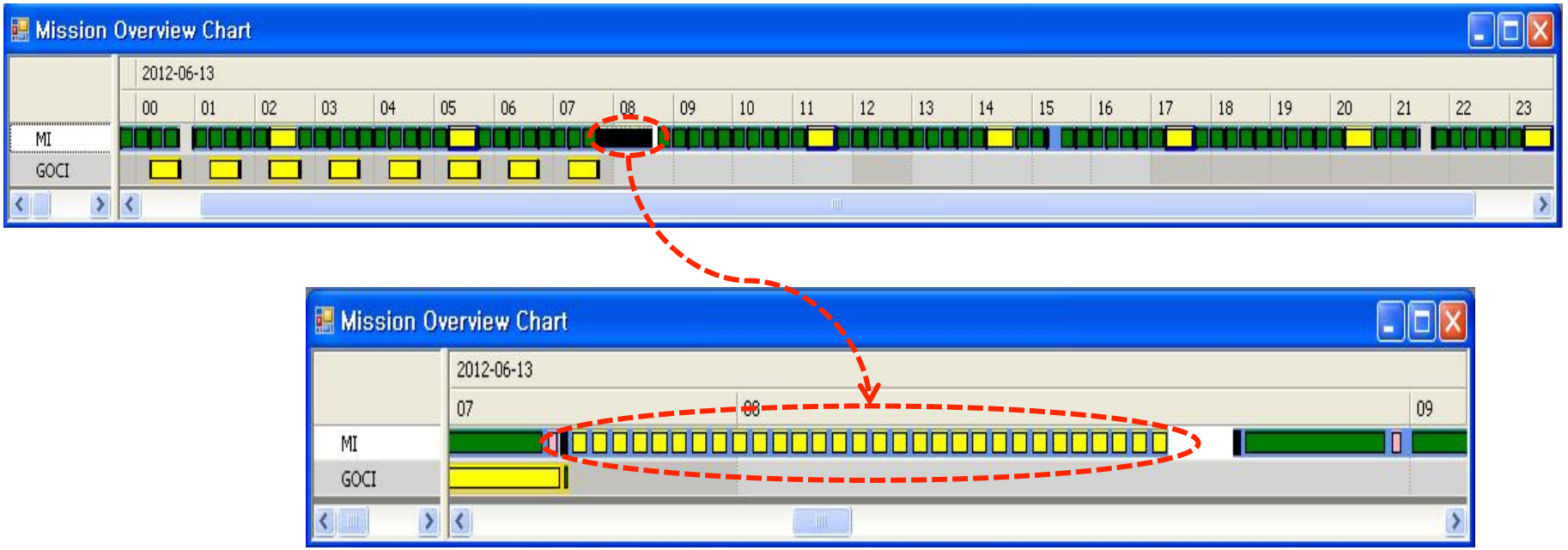


[figure8. A monthly mission schedule of the Earth observation for the COMS normal operation (MOON Imaging)]

Seasonal Mission Planning

- **Dark Imaging**

- to monitor radiometric performance variation of the MI infrared channel
- taken every quarter of a year



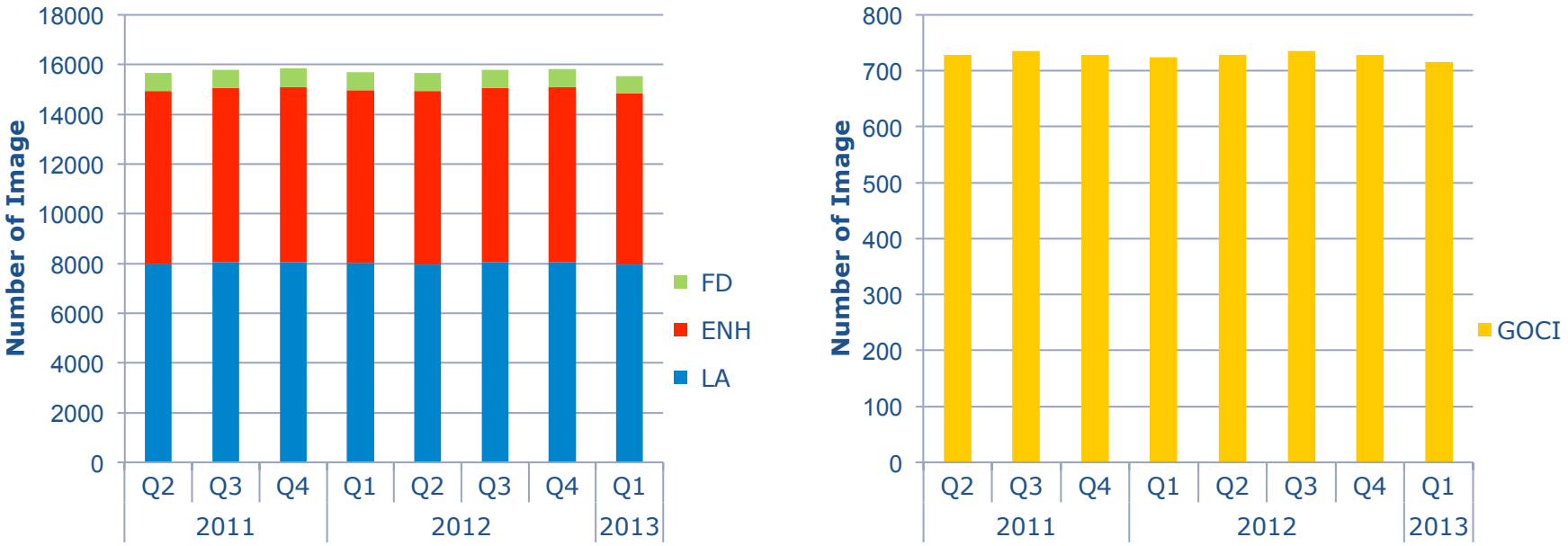
[figure9. A seasonal mission schedule of the Earth observation for the COMS normal operation (DARK Imaging)]

Mission Plan Result(1/2)

Class	Operation Activity	Planned Operation Period	Achieved Operation Number
Daily	MI Mission	every day	731
	GOCI Mission	every day	731
	WOL	2 times/day	1462
Weekly	NSSK	1 time/week	106
	EWSK	1 time/week	117
Monthly	Oscillator Update	1 time/4weeks	25
	IRES Moon Blinding Table Update	1 time/month	24
	Moon Imaging	1 time/month	24
Seasonal	Dark Imaging	1 time/quarter	9

[table1. achieved operation number of the mission planning]

Mission Plan Result(2/2)



[figure10. meteorological and ocean mission planning result]

☞ The successful mission planning is confirmed with the result of the normal operation during the two years of the normal operation from April, 2011 to March, 2013.

References

[1] Cho, Y. and Youn, H., “Characteristics of COMS Meteorological Imager”, Proceedings of SPIE, Vol.6361, pp. 63611G-1~8 (2006)

[2] Cho, Y., “COMS Normal Operation for Earth Observation Mission”, Korean Journal of Remote Sensing, Vol. 29, No. 3, pp. 337-349 (2013)

[3] Kim, I., “Design Concept and Operations of Mission Planning System for COMS”, The Institute of Electronics, Information and Communication Engineers


Thank You !