Weathernews Inc. Challenge

What would we want realize with nano-satellite?

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WNI's Challenge

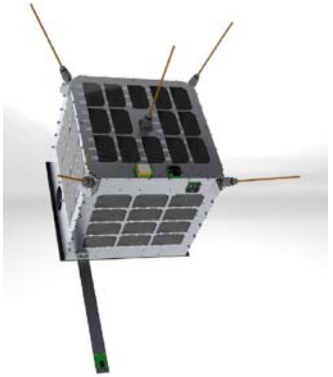
- **Finding a path to realize private company's own space system as the actual business application.**
- **Supporting challenger who try to find a new way in the space industry.**

At present, private company cannot readily decide to have their own space system for their business.

WNI Way

- **Always trying to create valuable services for the customer with all possibilities.**
- **Never give up. Not to find the reason for not to do. To find the way to do.**

Satellite is one way.



Requirements as Business System

- **Balance between costs and effects.**
- **Business chance and speed merit.**
- **Satellite system is a component.**
- **Scenario of “Kotozukuri”.**

“Kotozukuri”

- **The most important thing.**
- **Finding hints in customers' issues, social issues, WNI's role, etc.**
- **Making harmonious and collaborative scenario for common goal.**
- **Co-working with people who have same motivation.**

Where is the field?

- **Stage of the shipping industry is vast oceans.**
- **We need tool with long reach for communication, wide range eyeservasion, etc.**

Satellite is a candidate.

 # Present nano-satellite technology brought us the benefits of actual space use in cost-effectiveness.

Back ground of First Challenge

- **The Global warming.**
- **Exhaustion of fossil fuels and rising fuel cost.**
- **CSR of shipping companies and WNI.**

Polar Routeing:
WNI and shipping companies had started preparation. Polar routeing has a possibility to solve these issues.

Satellite in the First Challenge

- **WNI has been challenging the satellite system for the sea ice monitoring.**
- **The WNISAT-1, sea ice monitoring satellite, will be launched in this autumn.**
- **The WNISAT-1 has the mission to VP, i.e. it will gathering information for the polar routeing and for the ice routeing.**



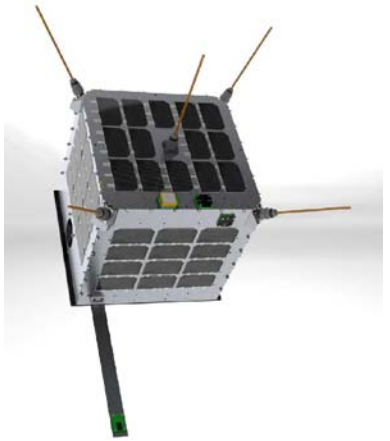

WNISAT-1 Missions

Mission 1 : Sea ice monitoring
For the safety navigation in iced sea.

Mission 2 : CO2 monitoring
As the shipping industry and WNI's CSR, WNISAT-1 will challenge CO2 monitoring in collaboration with the shipping industry.

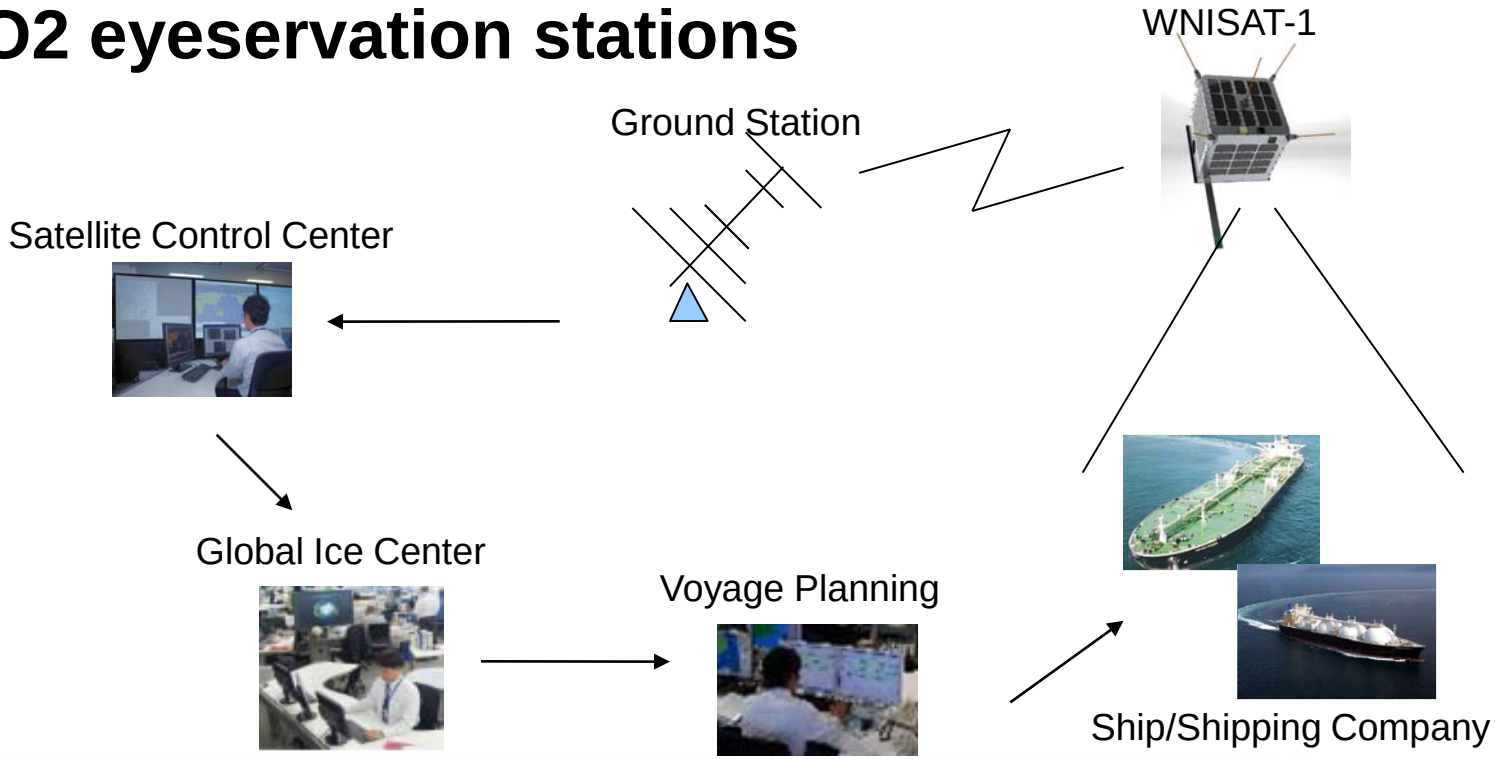
Satellite Specifications

Mission Equipments :
Visible and near infra-red cameras
Near infra-red LASER transmitters
Weight : 10kg
Dimensions : 27x27x27cm3
Attitude Control :
Earth oriented three axis control
Communication :
400MHz UHF link



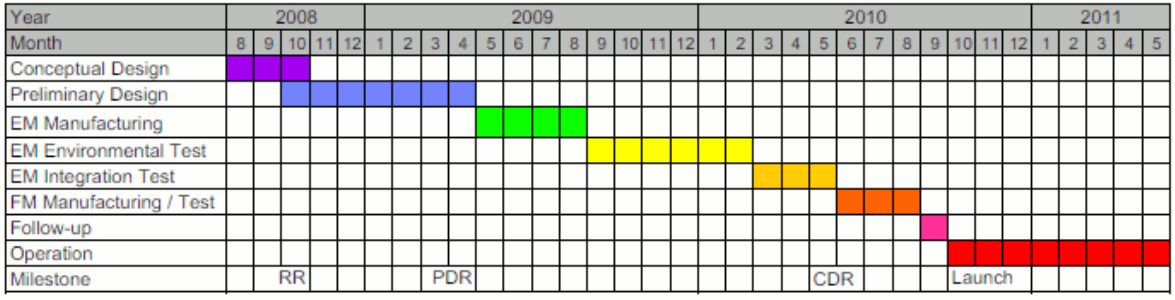
Satellite System Overview

- **WNISAT-1**
- **Satellite control center (SHIRASE)**
- **Ground stations (WNI GC, Tokyo Uni v.)**
- **CO2 eyeservation stations**



Schedule

- **Qualification tests using Engineering Model(EM) will finished at the end of May.**
- **Flight Model manufacturing will start in the next month.**
- **Negotiating with the launcher for the launch slot in this October.**
- **Test and trial operations will start in the next winter.**



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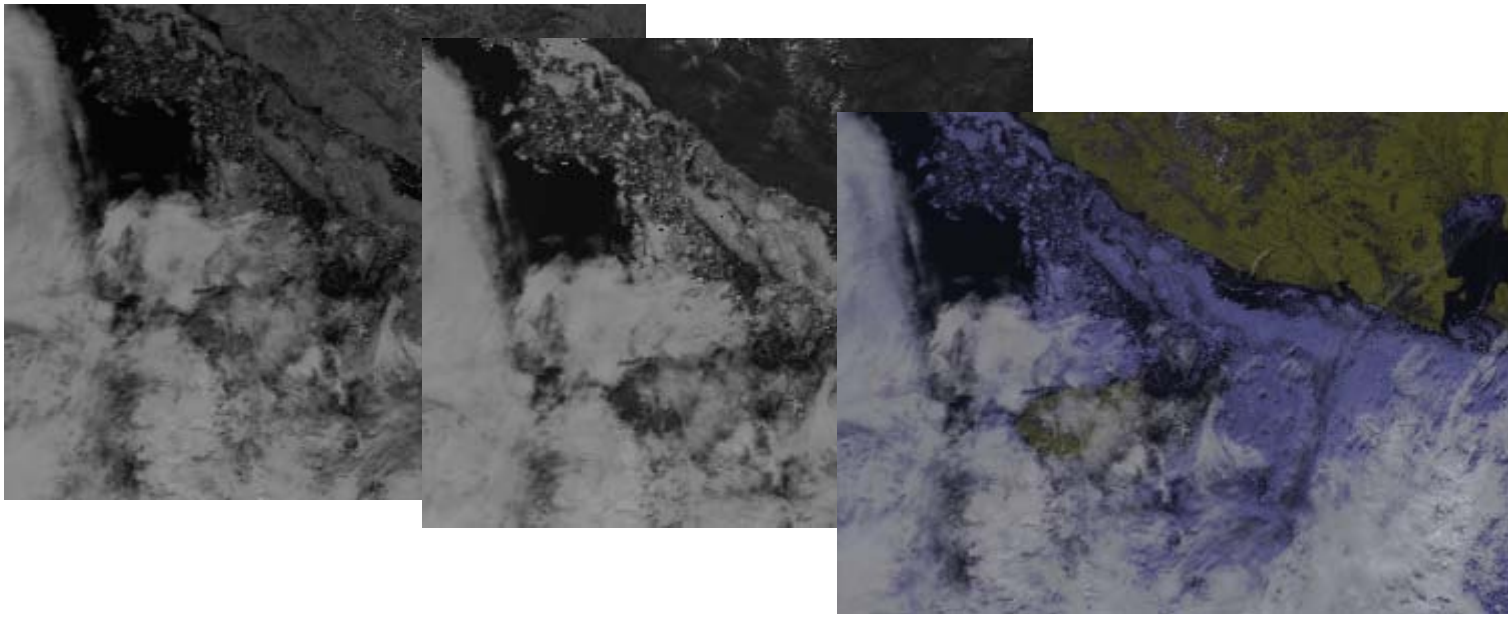
Sea Ice Monitoring

Phase 1 :
Raw data analysis by human operator.
Clouds elimination, sea ice information extraction, sea ice analysis, sea ice products making, everything will be done on the ground.



Sea Ice Monitoring

Phase 2 :
Automatic on board clouds elimination.

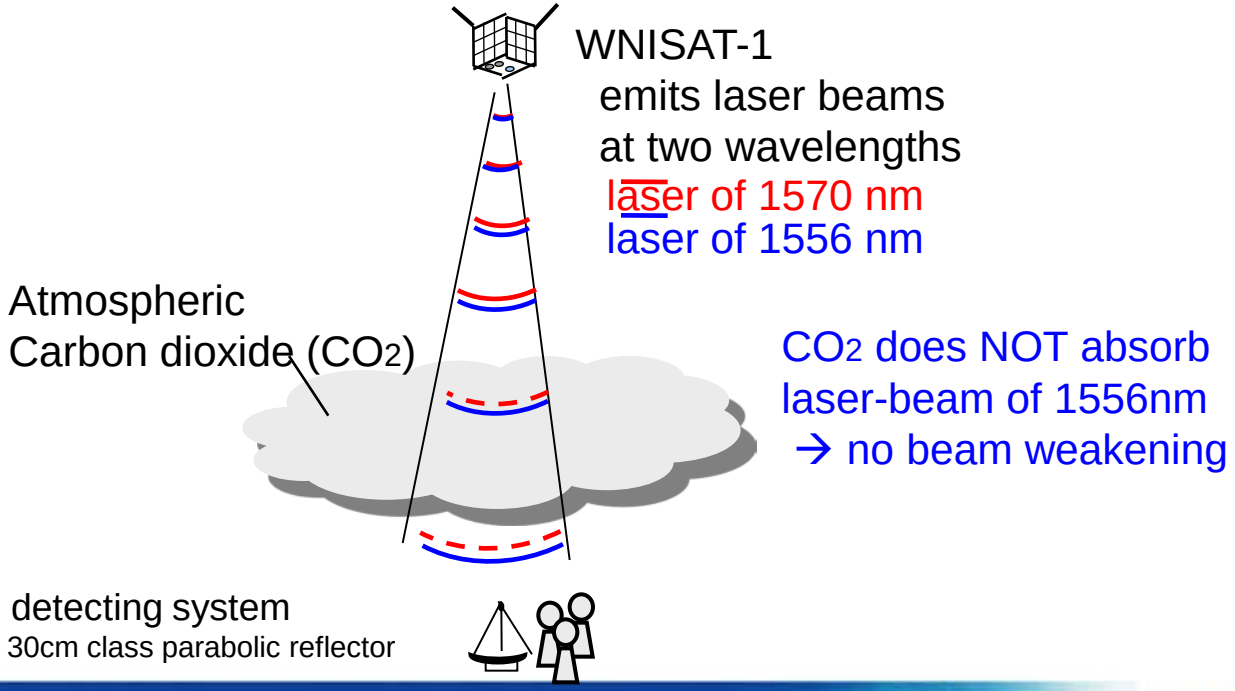
Phase 3 :
Automatic on board sea ice information extraction.

 # Restricted FCC allowance limits transmission volume of eyeserved data.
Processing data on board will be required for getting more information.

CO2 Monitoring

WNISAT-1 will try to collect basic information and find the feasibility.

- Laser transmission and reception.
- Confirmation of laser attenuation.



Follow on Mission

Optical communication feasibility

WNISAT-1 will test optical communication to the ground using mission 2 equipment.

 # For future plan: to avoid the FCC issue.

Next Challenges

- **What can WNISAT do for the ship safety?**
- **What can WNISAT do for the oceanic environments?**

Ex.

Pirates routeing.
Hazardous area detection.
Exploration of freak wave.
…

Conclusion

- **Through the “Kotozukuri” including the WNISAT-1 system, one of nano-satellite utilization way in the private company's business field is being revealed.**

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Always WITH you!