UNMANNED VEHICLES

INTEGRATED ENVIRONMENTAL SURVEILLANCE USING UNMANNED VEHICLE SYSTEMS

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UNMANNED SYSTEMS FOR MARITIME OPERATIONS
Established in 2005
Located in Trondheim, Asker and Eggemoen
Step-by-step growth
14 employes
MARITIME ROBOTICS DELIVERS

- Unmanned Vehicle Systems
  - Products (MBS, UAS, USV)
  - Training
  - After-sales/support

- Services with Unmanned Vehicle Systems
  - Moored Balloon Systems (OceanEye)
  - Unmanned Aircraft Systems
    - Multi-copters
    - Fixed–wings
  - Unmanned Surface Vehicles
Oil - Spill - Response
MOORED BALLOON SYSTEMS
OceanEye® components

**01** OceanEye® Balloon

**02** OceanEye® Base unit

**03** OceanEye® Sensor unit

**04** OceanEye® Viewer terminal

**05** OceanEye® Self-contained and rapidly deployable

**Weight:** 425 kg / 936 lbs (with all system components packed)

**Length x Wide x Height:** 1.20 x 0.80 x 1.59 m / 47.3 x 31.5 x 62.6 inches
OceanEye – your own eye in the sky
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OceanEye – aiding oil recovery operations
OceanEye – aiding oil dispersant operations
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OceanEye – *aiding oil dispersant operations*
OceanEye – arctic operations and ice management
OceanEye™

Ice management experiments on East-Greenland
UNMANNED AIRCRAFT SYSTEMS
PENGUIN MR
UNMANNED AIRCRAFT SYSTEM
- **Day-light camera (EO)**
  - Captures still images or video
  - Intuitive and easy understandable information
  - Limited by weather and darkness

- **Infrared (IR)**
  - "Sees" the infrared spectrum day and night
  - May give add-on info to EO (heat, thickness etc)
  - Affected by dense fog and rain etc
Ubemannet luftfartøy, droner og RPAS

Nyheter

Dronelek
Skal du bruke drone for lek og hobby?
Les våre enkle regler og retningslinjer her.
www.dronelek.no (bokmål)
www.dronelek.no (nynorsk)

Status for droneeksamen
Pilot og fartøysjef i RO2 og RO3 må bestå en eksamen for å kunne utføre flyging. Eksamen vil gjennomføres elektronisk ved bruk av PC. Det vil bli utarbeidet flervalgs spørsmål som har 4 alternative svar, der ett av svaralternativene er korrekt. For å oppnå bestått må kandidaten ha minimum 75 % rette svar.

Hold avstand fra lufthavner:
Ikke fly nærmere enn 5 km.

Du skal alltid kunne se dronen.
Maksimal flyhøyde er 120 meter over bakken.

Hold en avstand på 150 meter fra folk, bygninger og trafikk. Gjelder trafikk på veier, på sjøen og i luften.
UAS AIR REGULATIONS

- An UAS is a flying object affected by national/international civil aviation laws

- Today's regulation
  - Visual Line of Sight (VLOS) operations is allowed below 500 feet and performed by a licensed UAS operator
  - Beyond Line of Sight (BLOS) operations is only allowed within a segregated airspace and performed by a specially BLOS licensed UAS operator

- BLOS today
  - Existing segregated airspace
    - Control zones, established danger areas etc
    - Establish procedures with nearest Air Traffic Control
  - Outside existing segregated airspace
    - After an application from the UAS operator, the Civil Aviation Authorities can define a temporary danger zone
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UNMANNED SURFACE VEHICLES
MARINER

UNMANNED SURFACE VEHICLE
USV CONVERSION SYSTEM
Environmental Data Acquisition

SENSORS
Fluorometer
Echosounder
Chemical sensors
CO2
O2
THANK YOU FOR
YOUR ATTENTION