ISEC presentation

Nuclear monitoring solutions for the future

nms

The core facts of ISEC

"We safeguard reliable monitoring of nuclear facilities"
The ISEC vision

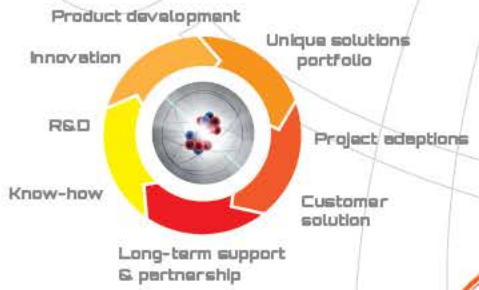
World wide prescense

Strong delivery record

ISEC

IAEA

Regulation adapted solutions

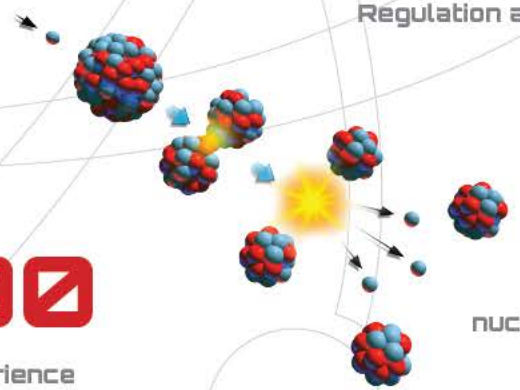


ISEC's eco system

Strong international patent portfolio

1990

Long experience



Focus on nuclear monitoring

Why nuclear monitoring?

$1,500,000/day

Prevent loss of production

PHYSIOLOGICAL

ENVIRONMENTAL

New and stringent monitoring regulations

100% AVAILABILITY

Increased monitoring up time

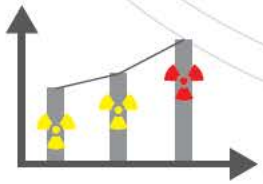
BIG DATA

Data collection

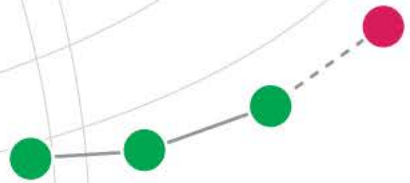
Data analysis

Data presentation

Adaption to site needs



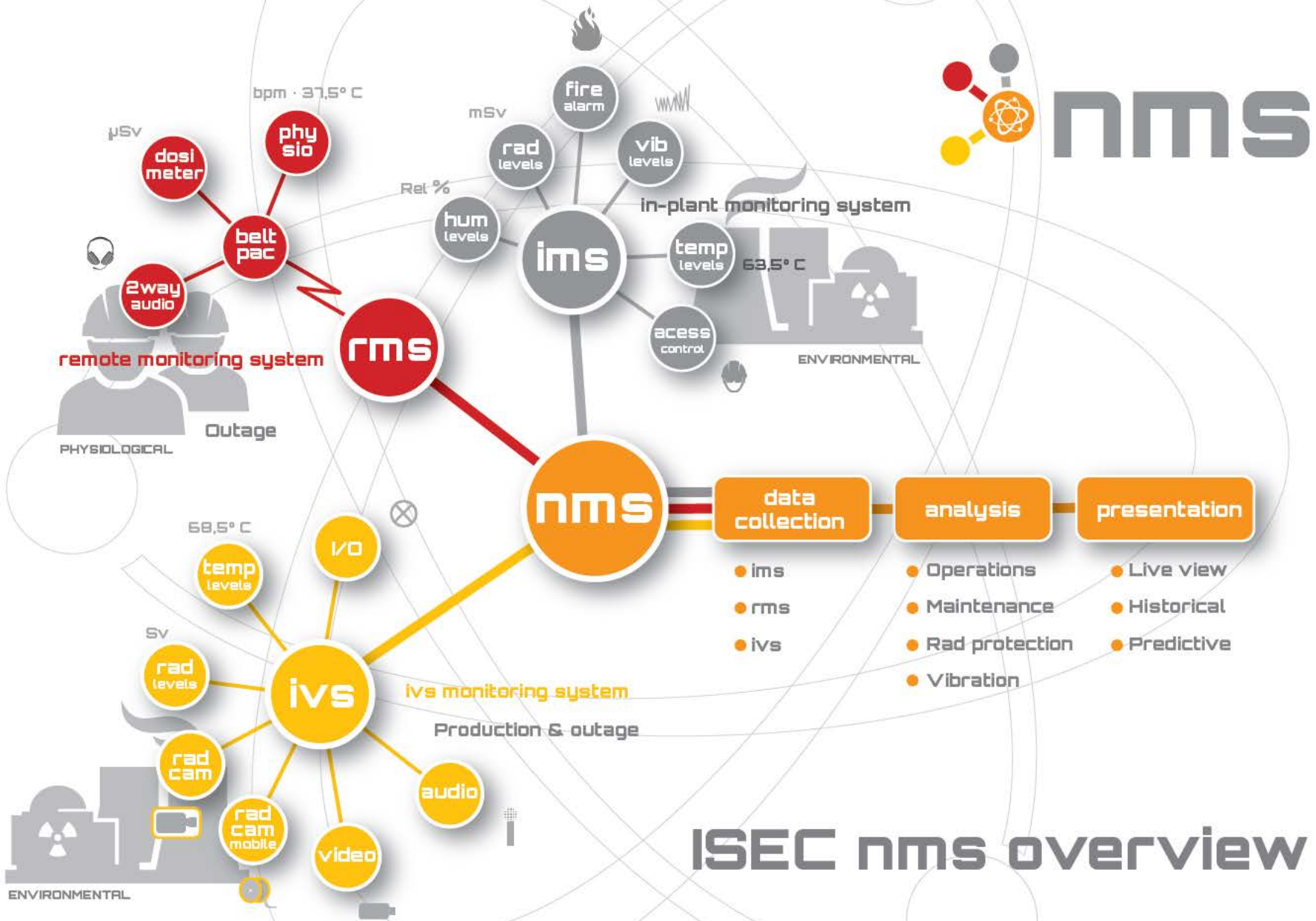
Monitor rad levels during production



Predict equipment failure

Increased plant safety

Assist ALARA focus


nms
bpm · 37,5° C
µSv
dosi meter
phy sio
belt pac
2way audio
remote monitoring system
PHYSIOLOGICAL
Outage
mSv
fire alarm
rad levels
vib levels
Rel %
hum levels
ims
in-plant monitoring system
temp levels
63,5° C
acess control
ENVIRONMENTAL
rms
nms
data collection
analysis
presentation
ims
rms
ivs
Operations
Maintenance
Rad protection
Vibration
Live view
Historical
Predictive
68,5° C
temp levels
I/O
Sv
rad levels
ivs
ivs monitoring system
Production & outage
rad cam
rad cam mobile
video
audio
ENVIRONMENTAL
ISEC nms overview

Challenges within Nuclear Power Plants

- General aspects for equipment within containment
  - High ionizing radiation from neutron and gamma
  - Temperature up to 90 °C
  - Continuously active for minimum 24 months

- Geographical aspects
  - Regulations
    - Differs from country to country
    - Differs even from plant to plant within the same country
  - The Fukushima Daiichi nuclear disaster
    - Earthquake testing


radcam

Create a network of excellence

- Use ISEC's 25 year experience within nuclear monitoring
  - RADCAM series of radiation hardened cameras and sensors
  - Together with our Nuclear Monitoring System

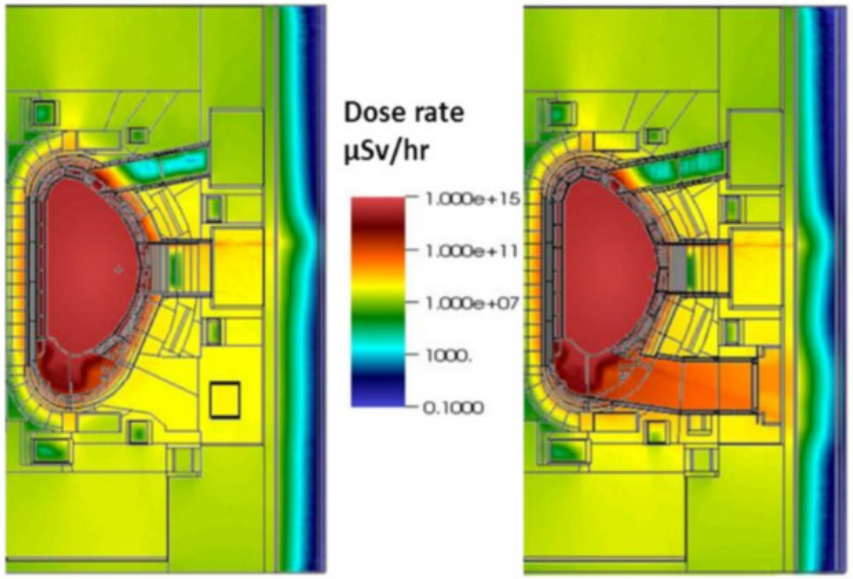
- Combine our knowledge with a multitude of research projects
  - Highly advanced 3D graphic Human Machine Interface software
  - Host Master and PhD thesis at ISEC office
    - In collaboration with Faculty of Engineering, LTH, Lund
    - In collaboration with Linnaeus University, Växjö
  - Research project exclusively for ISEC at Jozef Stefan institute in Ljubljana – IJS
    - Vinnova project application rejected
  - Bidding as industry partner for the Horizon 2020 Initial Training Network - ITN

ITN - One of our Big Science commitment

- Marie Sklodowska-Curie Innovative Training Network (ITN)
  - Offer early-stage researchers opportunity to improve research skills for 3 years
  - Budget of € 370.000.000 with a total of 1,567 proposals
- Bidding for “HARD”: Highly Advanced Radiation Detectors
  - WP3 - Behaviour of silicon material at extreme fluences of particles
  - WP6 - Development of integrated silicon dosimetry
- The main academic partners
  - University of Liverpool
  - CNM-IBM Barcelona
  - LPNHE Paris
  - CERN
  - Jozef Stefan Institute

Challenges for ISEC within ITER & ESS

- Radiation resistance
  - ✓ Have been investigated for ITER and confirmed together with IJS
  - ✓ Behind biological shield there are up to 200 micro Sv/h, which is several order of magnitude lower than in the NPP (up to 200 mSv/h)
  - ❑ To be evaluated for ESS
- Temperature
  - ❑ To be investigated and approved
- Magnetic fields
  - ❑ To be evaluated and tested



Reference paper by A. M. Ibrahim et al., February 2014

Thank you!

Niklas Barringer niba@isec.se