

# Session II: Observation Needs

# State of the Science

## *Immediate Response*

- United States
  - 3 to 4 long term radiation dosimeters around facility periphery, checked monthly
  - Real time monitoring of normal release paths
  - 60-100 meter meteorological tower (try to be at stack height) with instruments at 10m and top of tower?
    - Sonics or cup and vane anemometer (winds)
    - Thermistors (temp)
- International
  - Doppler SODAR (wind profiling)
  - Handful of radiation monitoring around the facility
  - International database of facility information

# State of the Science

## *Long Term Response*

- Deployed airborne and in situ radiation measurements
  - Airborne search patterns and in situ sensor siting is based on limited information
- Available operational meteorological sources from region of interest
  - On site facility meteorological information
  - WMO surface observations
  - WMO radiosonde measurements
  - Radars
  - International reanalysis products
  - Satellite measurements

# Current Gaps

## *Immediate Response*

- Limited information on current status of reactor cores
- Determination of release path/fraction for a variety of accident sequences/scenarios
- Improved level of information on international facilities
  - Refueling strategies
  - Burnup
- No real time access to facility specific meteorological observations.
- Limited reactor accident sequence models with updated time history of release
- No real time access to facility stack emission information
- Better mechanism for obtaining information on current status of reactor support systems (better communications)

# Current Gaps

## *Long Term Response*

- Details of fate and transport of radionuclides of concern
- Better observing search pattern / sensor siting guidance
- Deployed meteorological in situ measurements (vertical profiles, good spatial distribution of observations, mobile weather radar measurements)
- Aircraft weather observations
- On site coolant measurements
- Details on fuel melt.

# Path Forward

## *Immediate Response*

- Research and develop and implement more robust and redundant power backup systems!!
- Research and develop autonomous monitoring systems that don't depend on onsite power.
- Develop procedures, methods, and models to optimally site radiation instrumentation around the facility based on predominant environmental conditions.
- Develop improved reactor models
- Quick start general guide for reacting to international nuclear accident/release

# Path Forward

## *Long Term Response*

- Utilization of UAV based observation systems
- Better reactor models
- Aircraft based weather observations
- Deployment of In situ weather instrumentation surrounding the area of concern
- Deployment of mobile weather radar instrumentation for improved precipitation estimation