



# Distributed Acoustic Sensing (DAS) for high resolution and high scale geophysical imaging

## Group Activity

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A LUNA company

### IR0000032 – ITINERIS, Italian Integrated Environmental Research Infrastructures System

(D.D. n. 130/2022 - CUP B53C22002150006) Funded by EU - Next Generation EU PNRR- Mission 4 “Education and Research” - Component 2: “From research to business” - Investment 3.1: “Fund for the realisation of an integrated system of research and innovation infrastructures”



Finanziato  
dall'Unione europea  
NextGenerationEU

Ministero  
dell'Università  
e della Ricerca

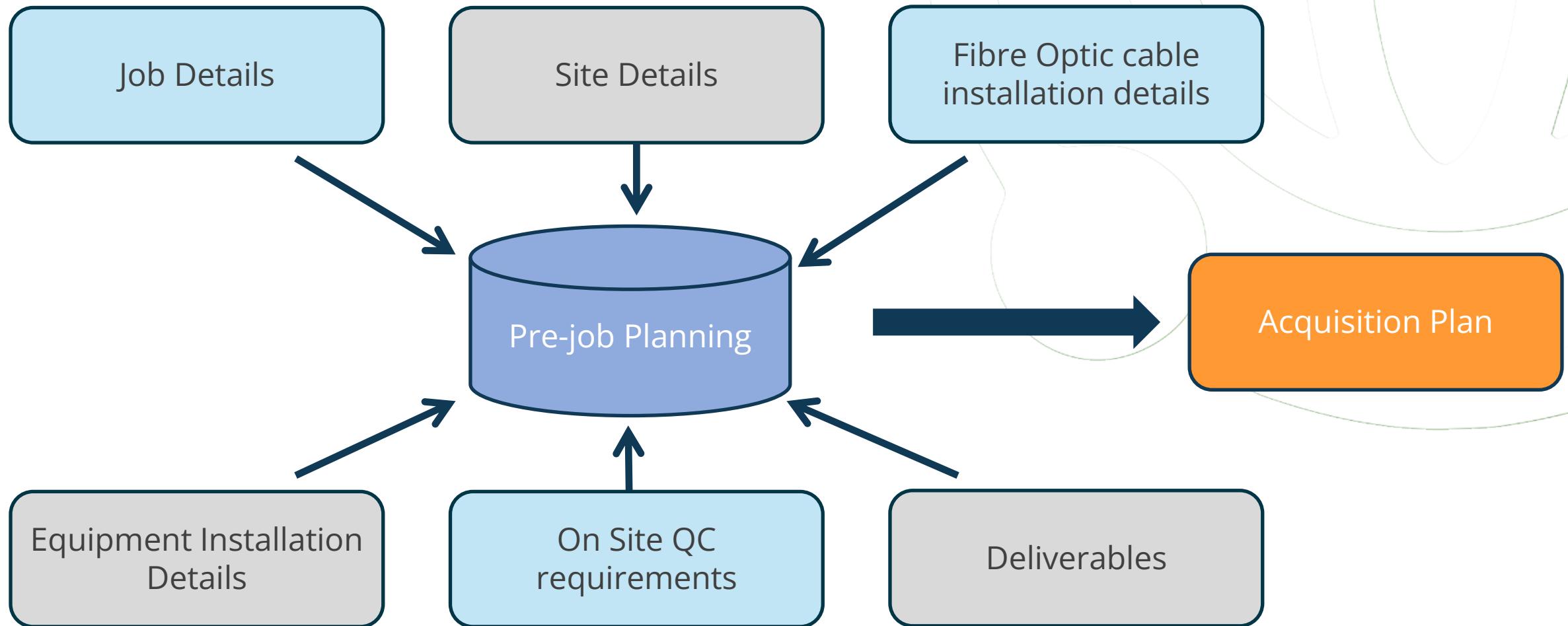


# DAS key parameters

Form groups of 5-6 people

- 15 minutes: What is your DFOS project
- 15 minutes: Pre-job planning / Acquisition plan
- 25 minutes (5 minutes per group): present a summary of the discussion

# Pre-job Planning Elements



# Pre-job planning

## Job Details

- Aim of the survey (including the size, depth and orientation of the imaging target)
- Type of survey, e.g. Zero-Offset, 2D, 3D, 4D
- Source details (frequency range, power, control)

## Site Details

- Location: How to get you and equipment there, local weather etc, what infrastructure is there?
- Well details: locations, completion diagrams, deviation surveys
- Trench layout if applicable (e.g. GPS coordinates)

## Fibre Optic cable installation details

- Cable type, number and types of fibres
- Installation method
- Access to fibre

## Equipment Installation Details

- Power supply, temperature, humidity, vibration
- Internet access
- Desk or rack space
- ATEX areas

## On Site QC requirements

- Real-time visualisation
- SNR, timing, signal quality
- Operational QC (missed shots / triggers)

## Deliverables

- Data: file format, file length, delivery method, number of copies
- Reports: Presentations, word documents, auxiliary files (e.g. NAV files)
- Deadlines

# Acquisition Plan

## Pre-job Setup

- How long will it take? (normally at least 1 day, maybe 2)
- Where will equipment be, where is power coming from?
- How will depth calibration be completed?

## Acquisition Settings

- Sampling frequency, gauge length
- Continuous or triggered acquisition
- Data rates

## Data Saving Plan

- File format
- Folder structure
- Required disk space
- Backup plan

## Auxiliary Data Access

- NAV file format and contents
- How will these files be transferred to you?
- Do those files need manipulation before SW can read them?

## In-field Processing

- Shot extraction required?
- Data curation e.g. decimation, common mode filtering
- Correlation, Stacking
- SEGY header formatting and customisation

## QC Workflow

- What QC plots will provide the right information?
- Shot / Receiver gather, SNR, frequency spectrum
- How will those be generated?

## Communication Plan

- How to communicate with others on site about what is happening and when?
- What is the current shot point? When should we start / stop recording?
- What should happen in the event of issues? How are decisions made?

# Survey planning

For 15 minutes, consider the following:

- ⌚ Aim of the DFOS survey
- ⌚ Site details (onshore, offshore, temperature, pressure, corrosion)
- ⌚ Fibre Optic cable installation details (downhole permanent/semipermanent/temporary, trenched, on seafloor)
- ⌚ What is the most important parameter for your application (GL, target frequency, spatial resolution)

# Project design/challenges

For 15 minutes, consider the following:

- ⌚ How you will set up the interrogator/s
- ⌚ What type of cables you will require, how many and what type of fibres. Will your cables be pre-terminated, what and how many in-well components you require, what other equipment do you need on-site, how many people.
- ⌚ Any concerns on how to couple the cable and how you will mitigate for poor coupling
- ⌚ Will you do any active measurements, what type of source, how you will be triggered by the source
- ⌚ Will you compare with other conventional sensors and how you will correlate with the sensors.
- ⌚ How you will store and stream data, what data format

# Summary

⌚ Application/ aim of survey

⌚ Planning

⌚ Challenges/Solutions



# THANKS!



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