



# Støymåling i en digital verden

Ken Milne, AkerBP

01-10-2019



# Agenda

**1** Eureka – Jobbe agilt

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**2** Noise Bhoys App

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**3** Visualisering

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**4** Veien videre

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# Eureka Crews – Digital Worker

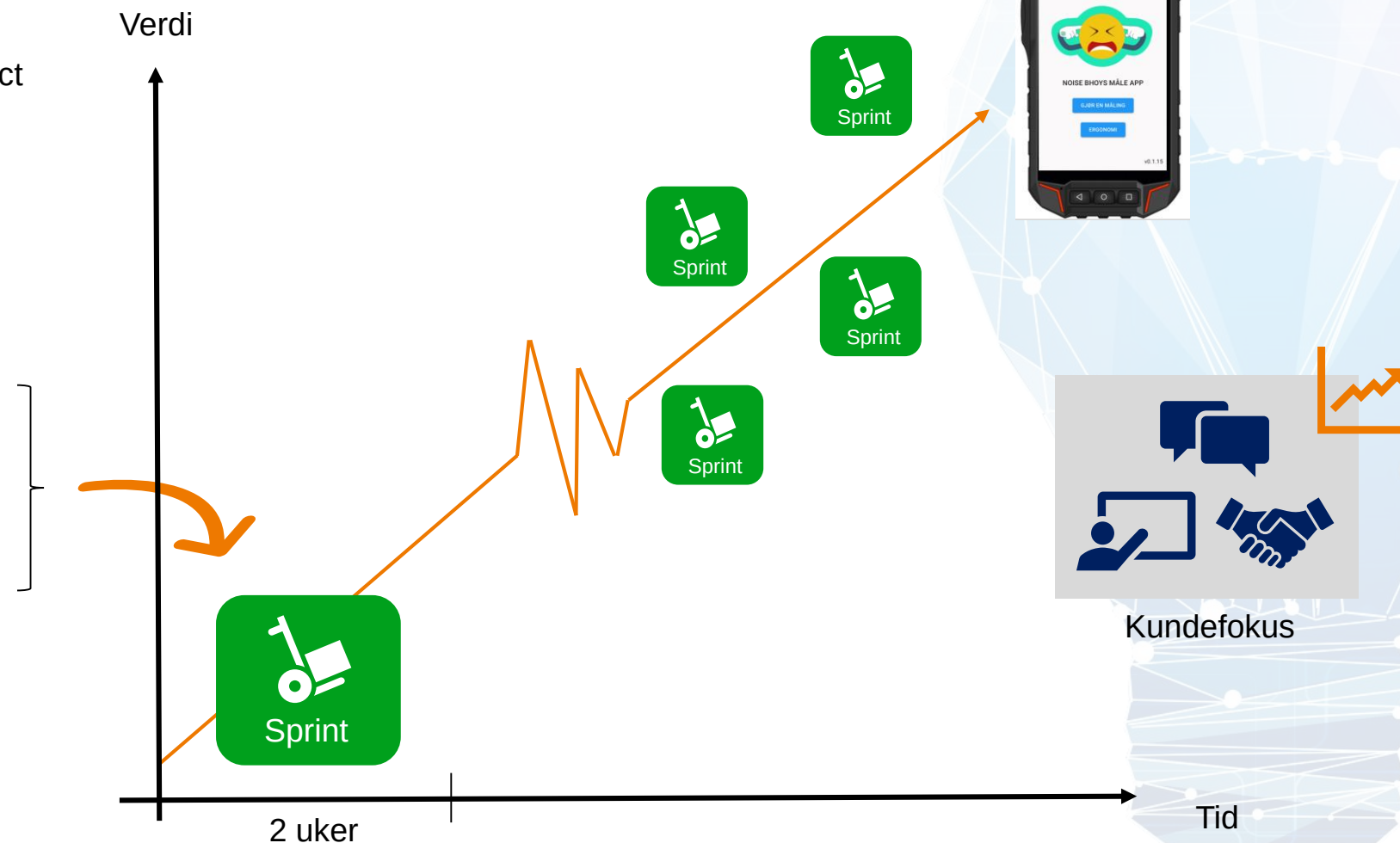


# Agile working



MVP – Minimum Viable Product

-  Oppdaterte støymåling
-  Visualisering i kveldsmøte appen





## BAKGRUNN

# Ide: Utvikle en applikasjon for støymåling

## Utfordring nåværende situasjon

### Støykart utdatert

- Mangel på loggføring av støydata, database, verifikasjon
- Excel ark på avveie

## Løsning på problem

- Utforske muligheter database, telefon og app for måling av arbeidsmiljødata over tid
- Øke støydatagrunnlag

## Aksjoner i sprintene

Utforske muligheter

**Telefon:** Nøyaktighet, brukervennlighet, grensesnitt (tag,database) SINUS

**Database:** CDP

**APP:** Desibel X Pro  
Noise Bhoys App

I.Safe EX IS520.1

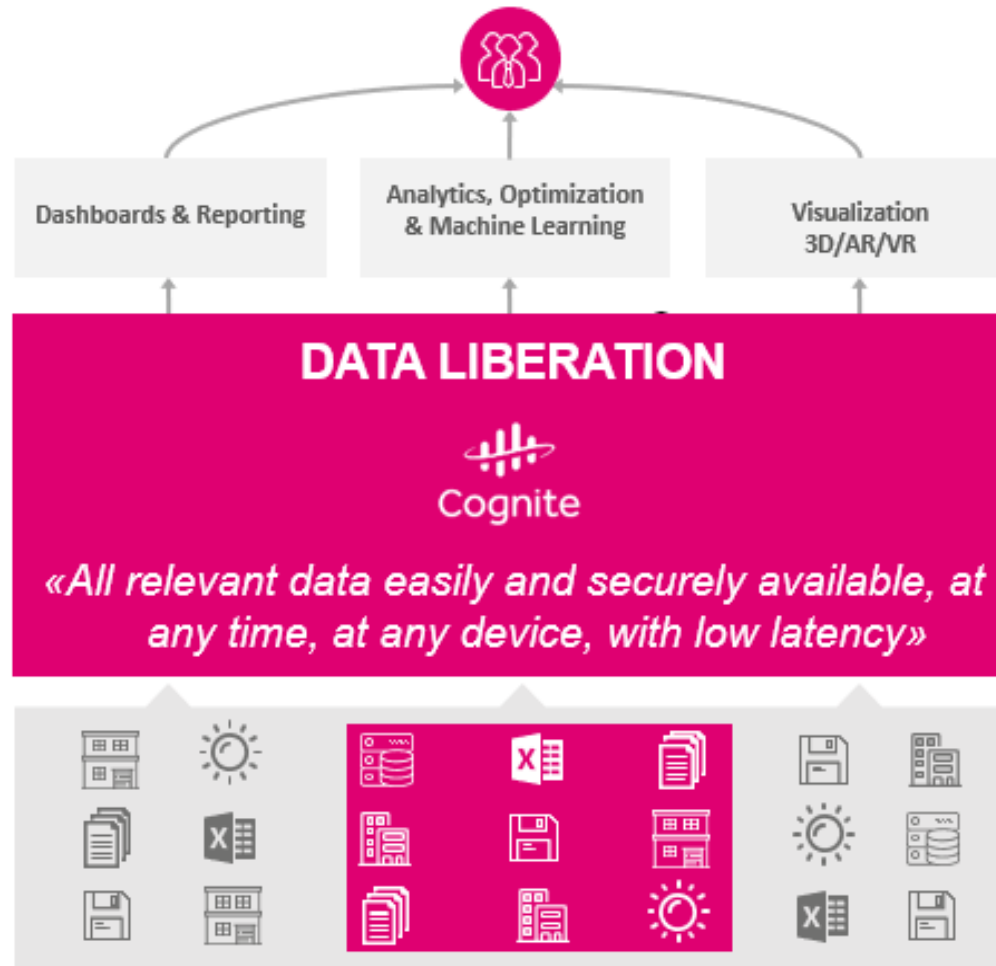


2014:

2017:

I morgen:





## Måleresultater - SINUS

- **75 – 105 dB – God nøyaktighet, innenfor intervall på ca + / - 1 dB**  
(Telefon må være kalibrert i app, ikke for mye lavfrekvent lydinnhold).
- **40 dB - Målinger på disse lydnivåer har store avvik.**  
(Nivåer under «støygulvet» i telefonen).
- **Målinger med rentone gir store avvik.**  
(Kontrollere «rentonebidrag» i lyd).
- **Kun opplært personell kan utføre målinger**  
(Opplæring offshore)



- i.safe MOBILE EX med appen Decibel X for Android
- Norsonic Nor140 lydmåler
  - Norsonic Nor280 forsterker (lydkilde: rosa støy, 50 – 5000 Hz)
  - Norsonic Nor276 høyttaler.

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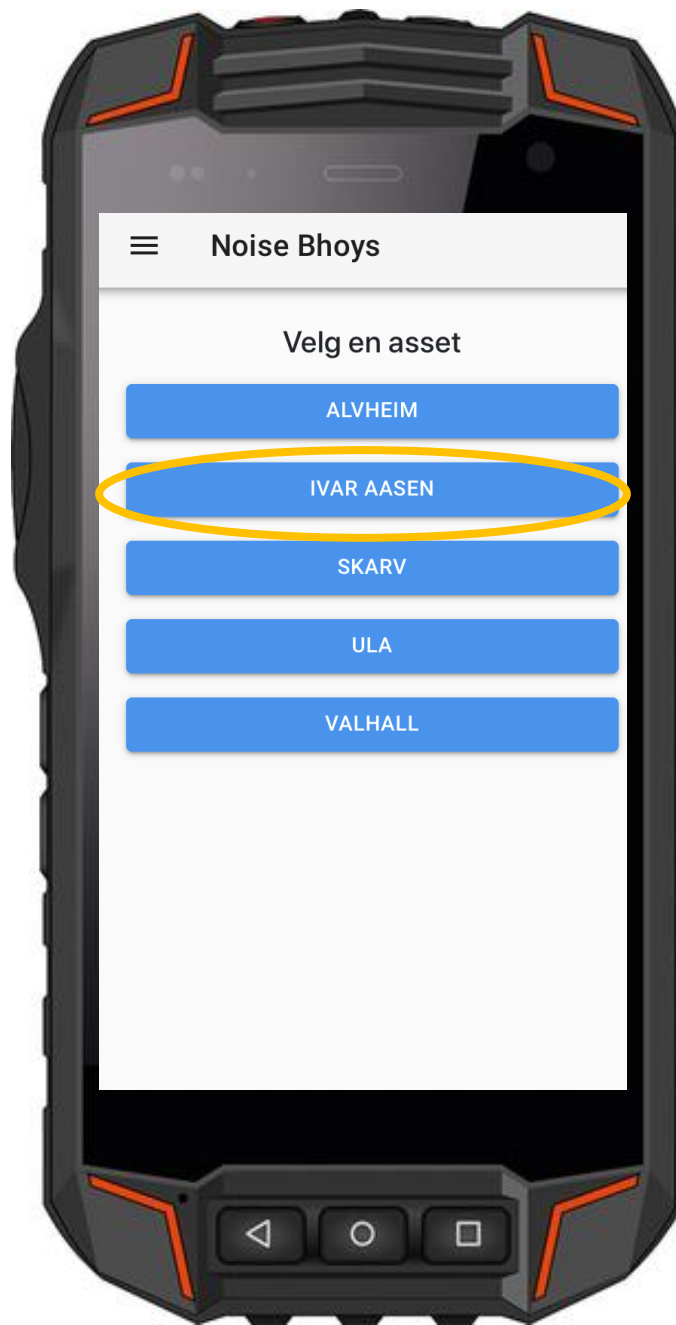
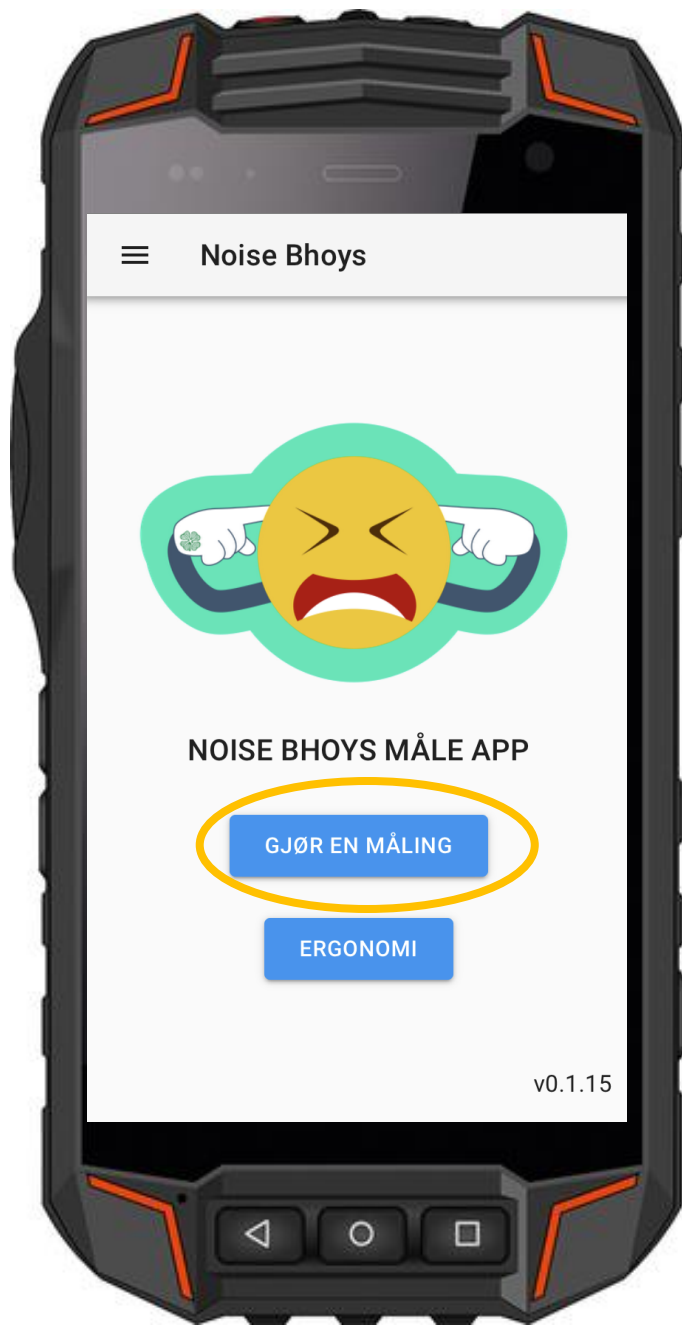
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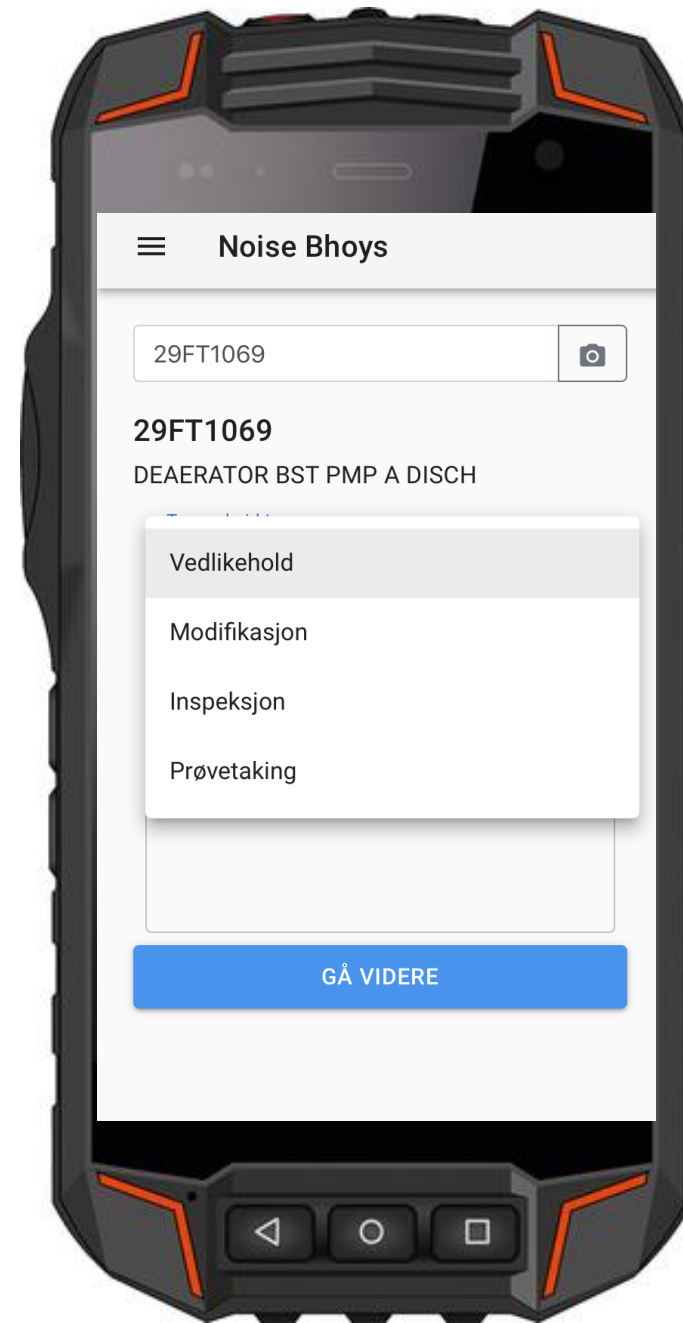
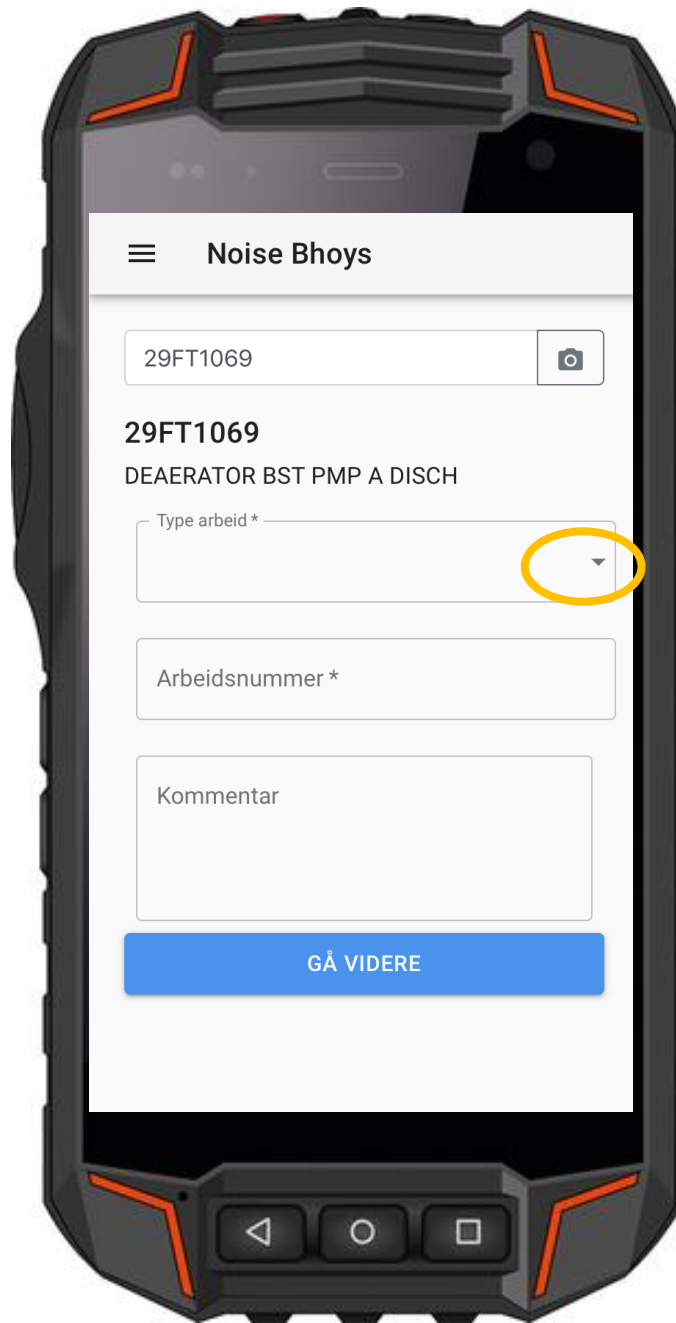
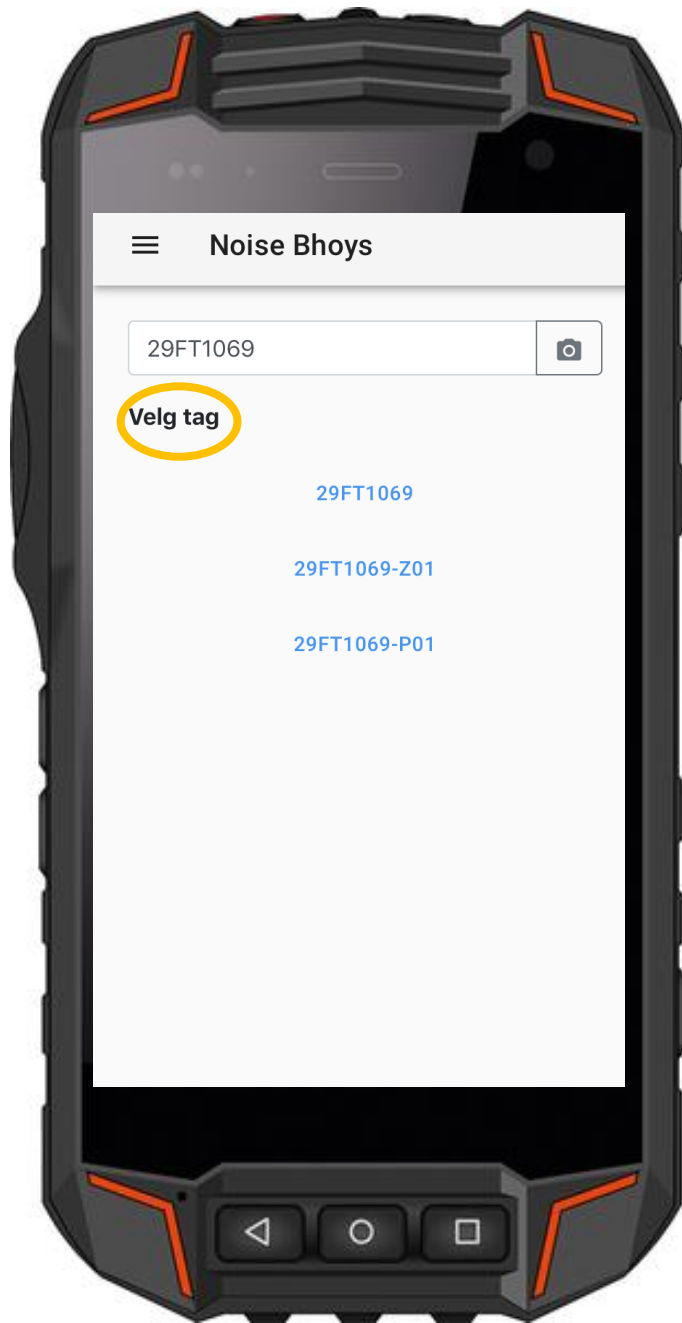
**4** Veien videre

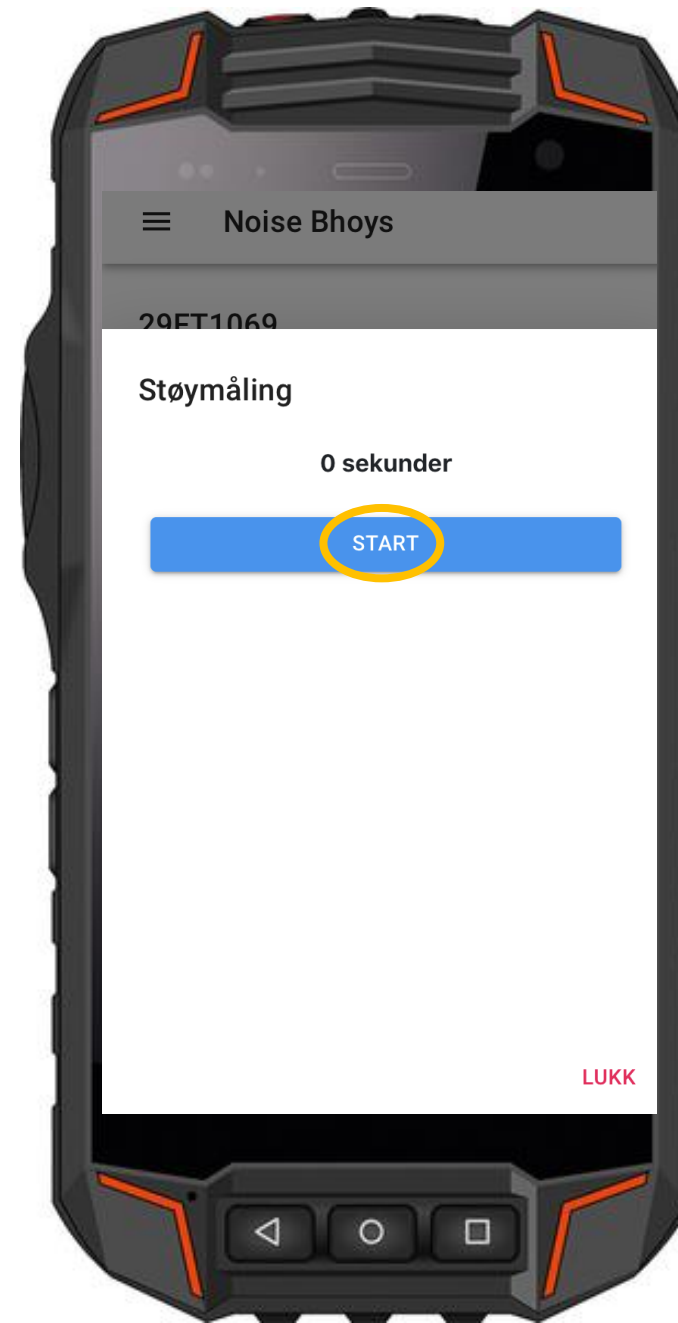
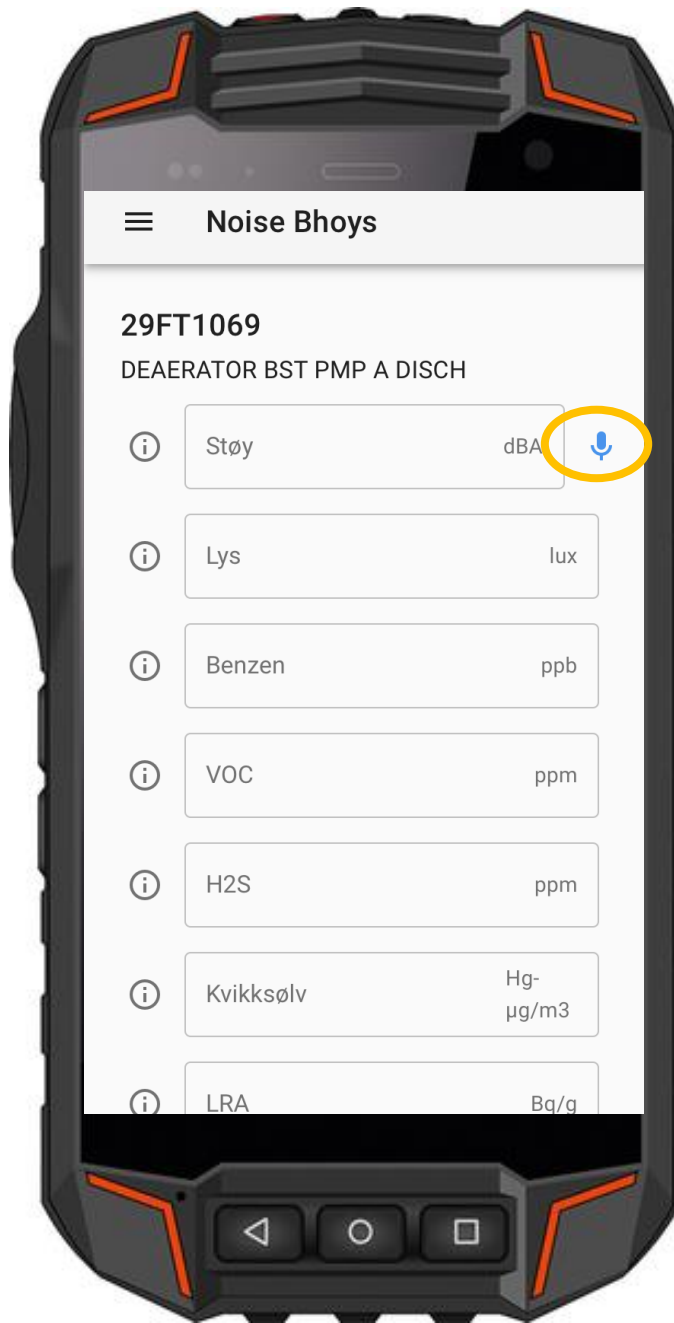
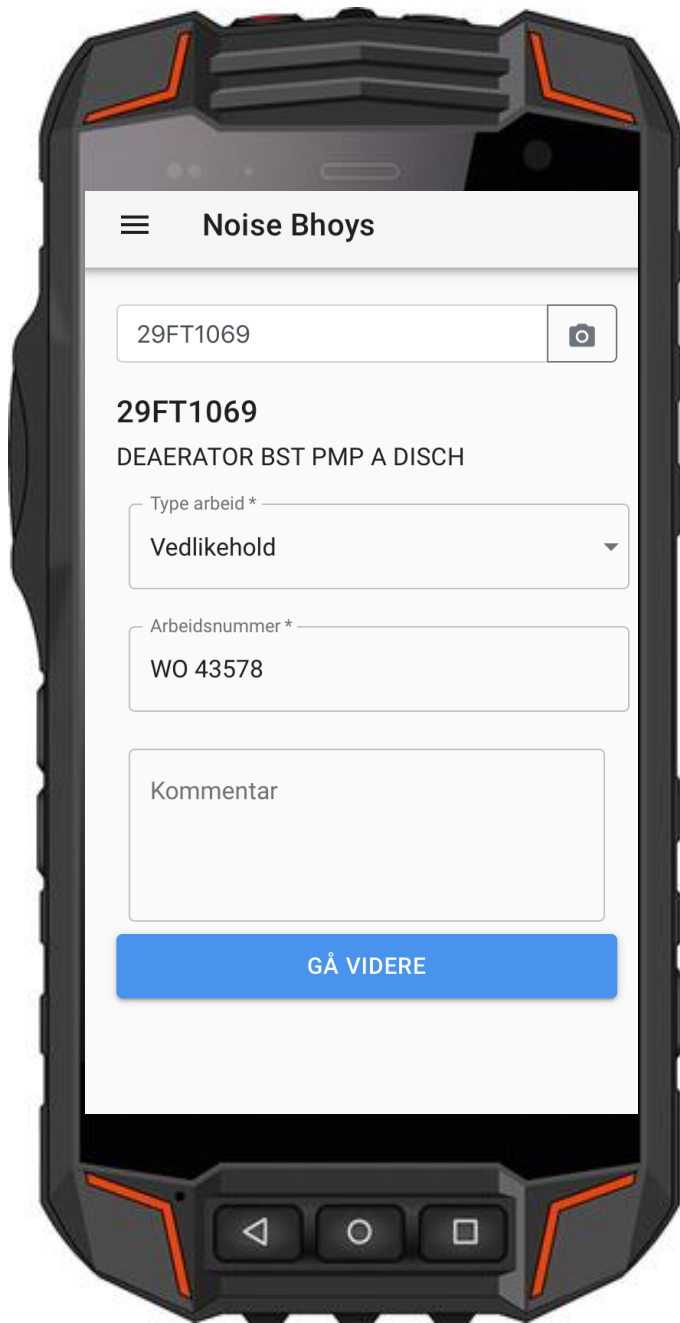
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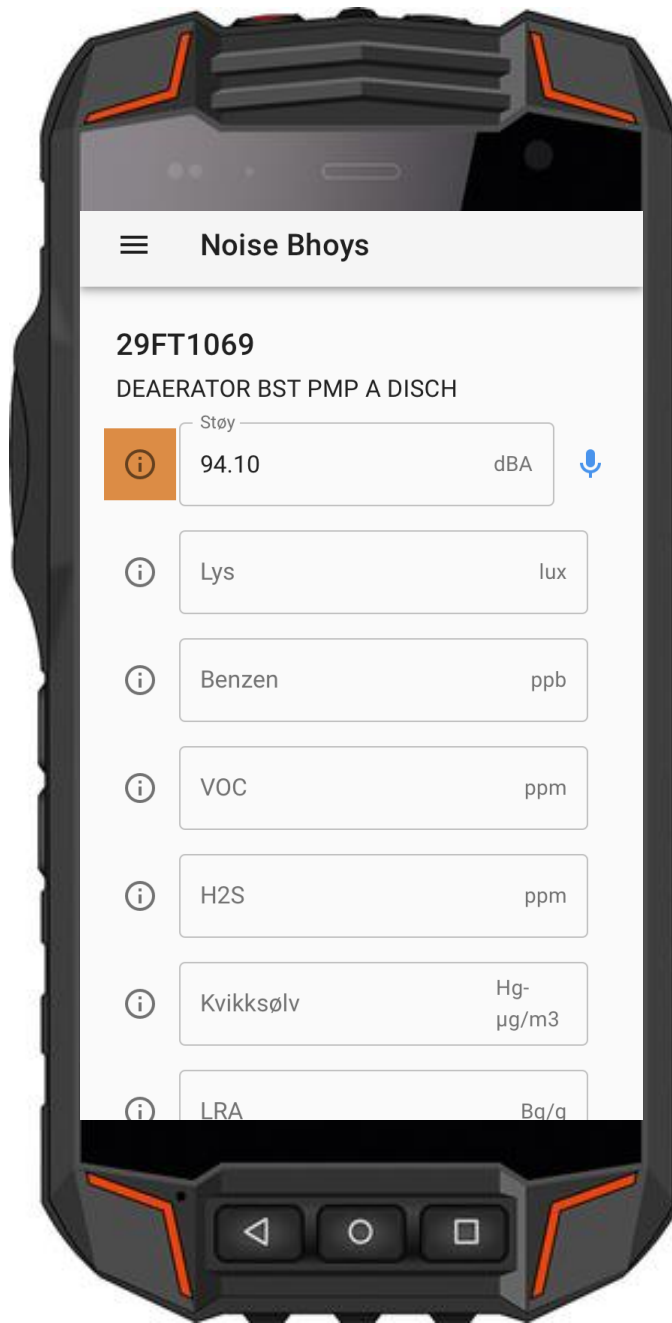




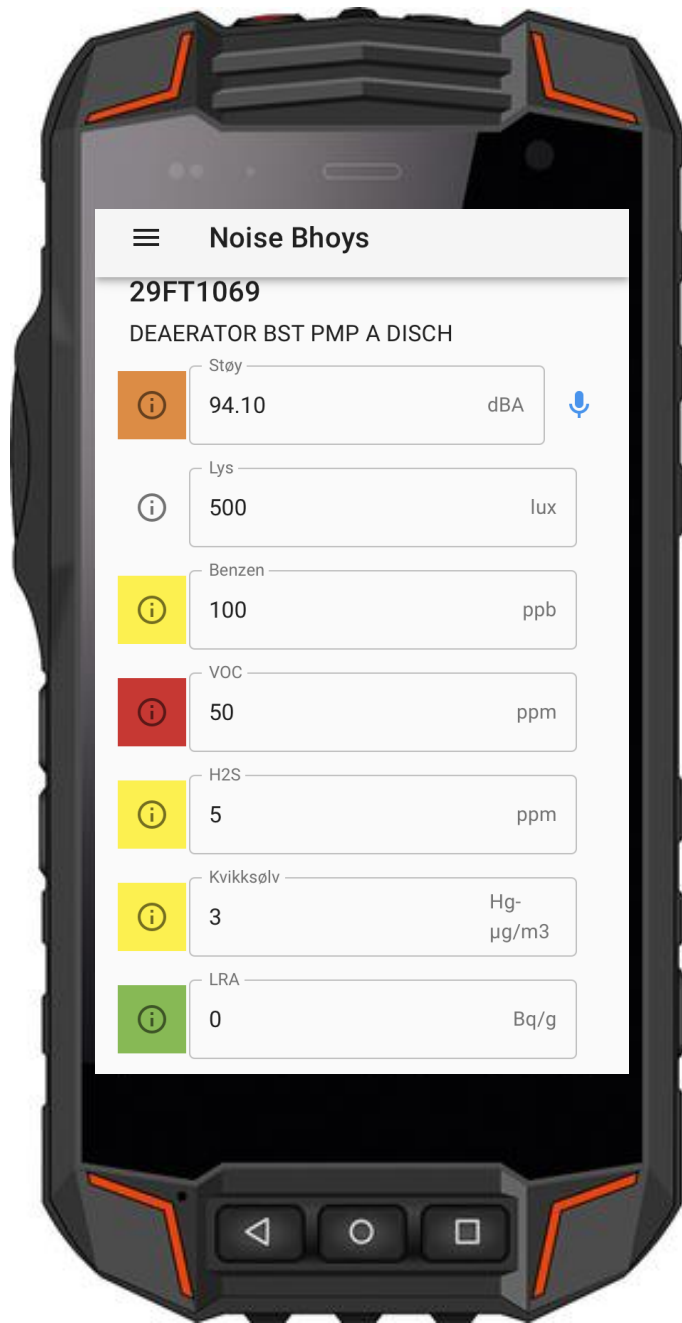












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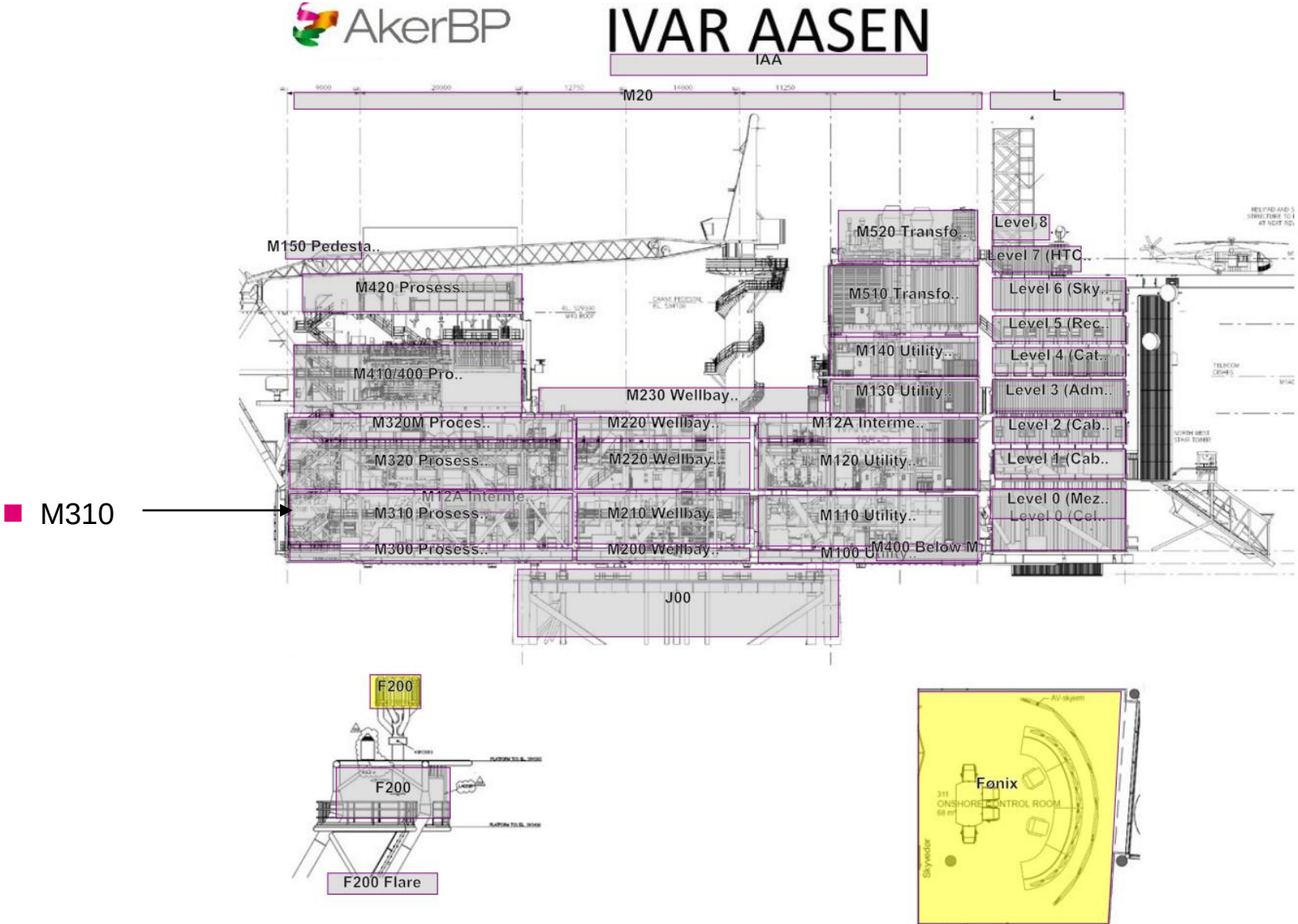
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**4** Veien videre

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2D MODELL



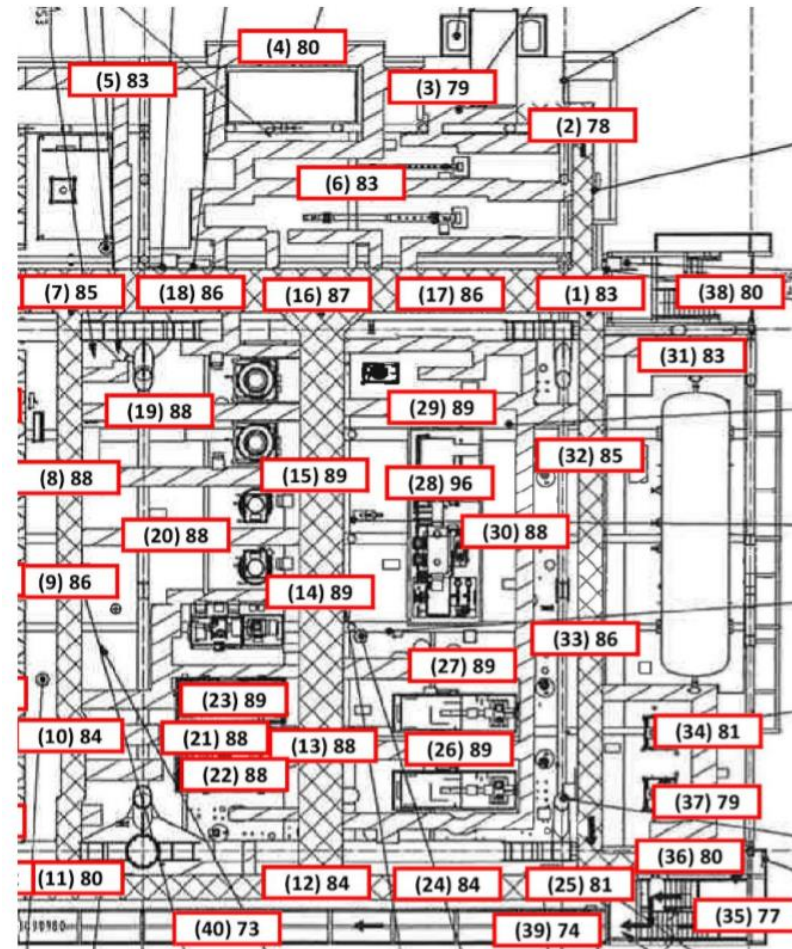


# Typisk rapport

4.25 M310 Cellar

Tabell 4.25: Målte støydata i M310 Cellar

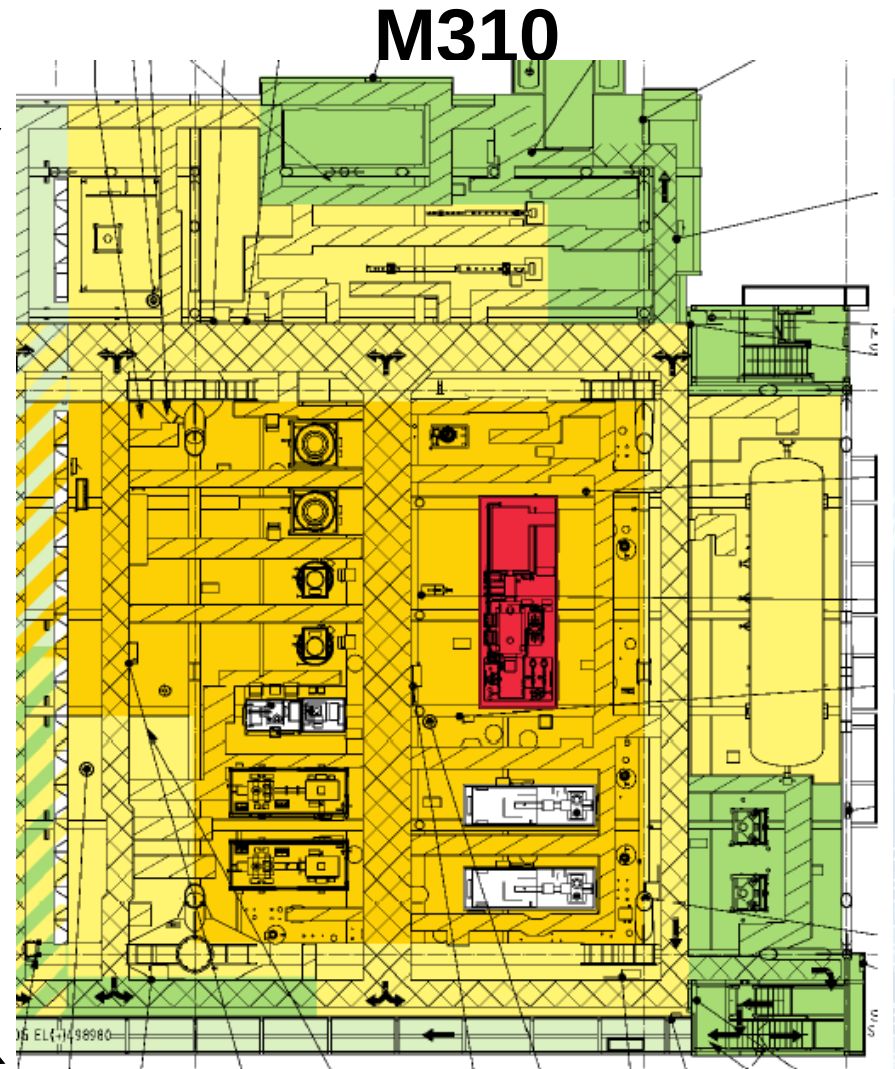
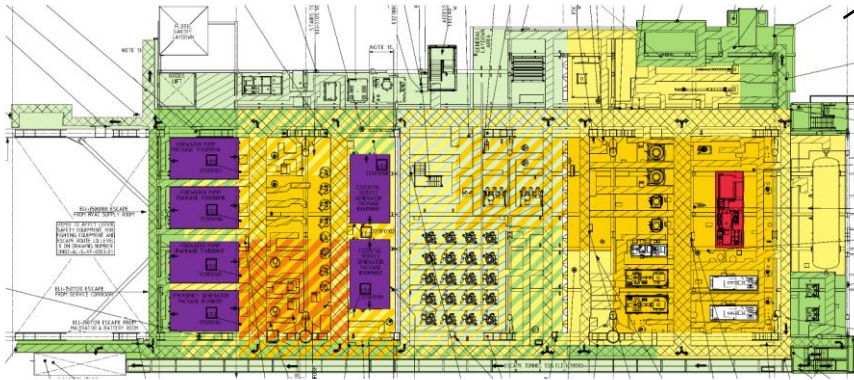
| Målnr. | Dato     | Dekk   | Modul | Støynivå |            |         | Kommentar |
|--------|----------|--------|-------|----------|------------|---------|-----------|
|        |          |        |       | Laeq     | Områdekrav | dBC-dBA |           |
| 1      | 08.11.17 | Cellar | M310  | 83       | 80         | 5       | Gangvei   |
| 2      | 08.11.17 | Cellar | M310  | 78       | 80         | 10      | Gangvei   |
| 3      | 08.11.17 | Cellar | M310  | 79       | 85/90      | 9       |           |
| 4      | 08.11.17 | Cellar | M310  | 80       | 85/90      | 6       |           |
| 5      | 08.11.17 | Cellar | M310  | 83       | 85/90      | 6       |           |
| 6      | 08.11.17 | Cellar | M310  | 83       | 85/90      | 7       |           |
| 7      | 08.11.17 | Cellar | M310  | 85       | 80         | 4       | Gangvei   |
| 8      | 08.11.17 | Cellar | M310  | 88       | 85/90      | 3       |           |
| 9      | 08.11.17 | Cellar | M310  | 86       | 85/90      | 4       |           |
| 10     | 08.11.17 | Cellar | M310  | 84       | 85/90      | 5       |           |
| 11     | 08.11.17 | Cellar | M310  | 80       | 80         | 10      | Gangvei   |
| 12     | 08.11.17 | Cellar | M310  | 84       | 80         | 7       | Gangvei   |
| 13     | 08.11.17 | Cellar | M310  | 88       | 85/90      | 4       |           |
| 14     | 08.11.17 | Cellar | M310  | 89       | 85/90      | 6       |           |
| 15     | 08.11.17 | Cellar | M310  | 89       | 85/90      | 7       |           |
| 16     | 08.11.17 | Cellar | M310  | 87       | 80         | 7       | Gangvei   |
| 17     | 08.11.17 | Cellar | M310  | 86       | 80         | 9       | Gangvei   |
| 18     | 08.11.17 | Cellar | M310  | 86       | 80         | 5       | Gangvei   |
| 19     | 08.11.17 | Cellar | M310  | 88       | 85/90      | 3       |           |
| 20     | 08.11.17 | Cellar | M310  | 88       | 85/90      | 5       |           |
| 21     | 08.11.17 | Cellar | M310  | 88       | 85/90      | 6       |           |
| 22     | 08.11.17 | Cellar | M310  | 88       | 85/90      | 1       |           |
| 23     | 08.11.17 | Cellar | M310  | 89       | 85/90      | 3       |           |
| 24     | 08.11.17 | Cellar | M310  | 84       | 80         | 6       | Gangvei   |
| 25     | 08.11.17 | Cellar | M310  | 81       | 80         | 9       | Gangvei   |
| 26     | 08.11.17 | Cellar | M310  | 89       | 85/90      | 6       |           |
| 27     | 08.11.17 | Cellar | M310  | 89       | 85/90      | 8       |           |
| 28     | 08.11.17 | Cellar | M310  | 96       | 85/90      | 2       |           |
| 29     | 08.11.17 | Cellar | M310  | 89       | 85/90      | 10      |           |
| 30     | 08.11.17 | Cellar | M310  | 88       | 85/90      | 11      |           |
| 31     | 08.11.17 | Cellar | M310  | 83       | 85/90      | 8       |           |
| 32     | 08.11.17 | Cellar | M310  | 85       | 85/90      | 7       |           |
| 33     | 08.11.17 | Cellar | M310  | 86       | 85/90      | 6       |           |
| 34     | 08.11.17 | Cellar | M310  | 81       | 85/90      | 11      |           |
| 35     | 08.11.17 | Cellar | M310  | 77       | 80         | 10      | Gangvei   |
| 36     | 08.11.17 | Cellar | M310  | 80       | 85/90      | 10      |           |
| 37     | 08.11.17 | Cellar | M310  | 79       | 85/90      | 8       |           |
| 38     | 08.11.17 | Cellar | M310  | 80       | 80         | 5       | Gangvei   |

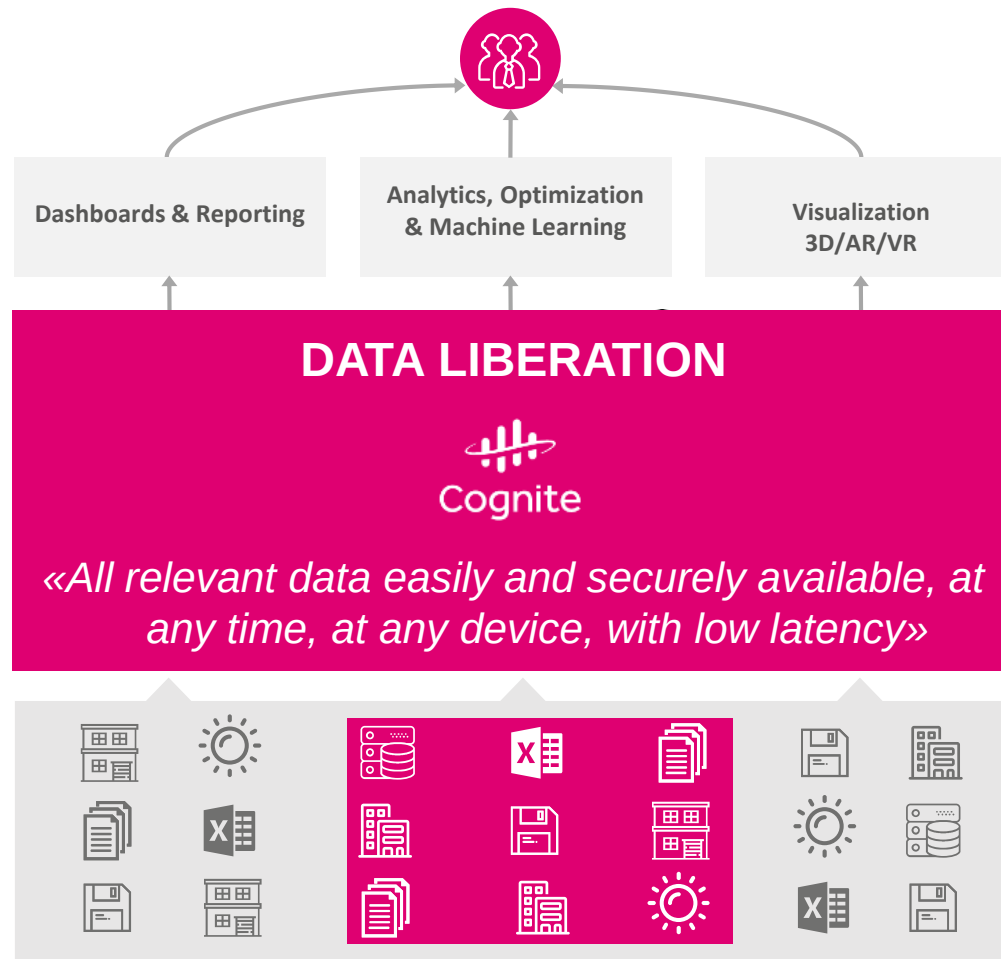




# Kjellerdekk

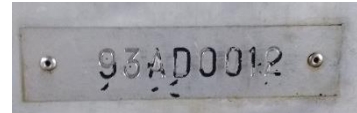
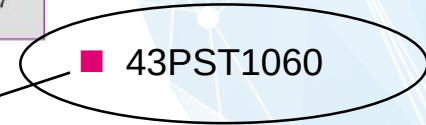
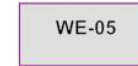
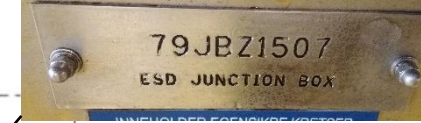
5.2 Støykart: Kjellerdekk







# M310 (Cellar Deck)



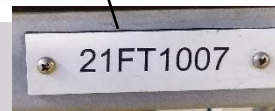
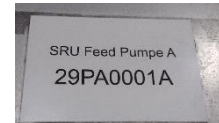
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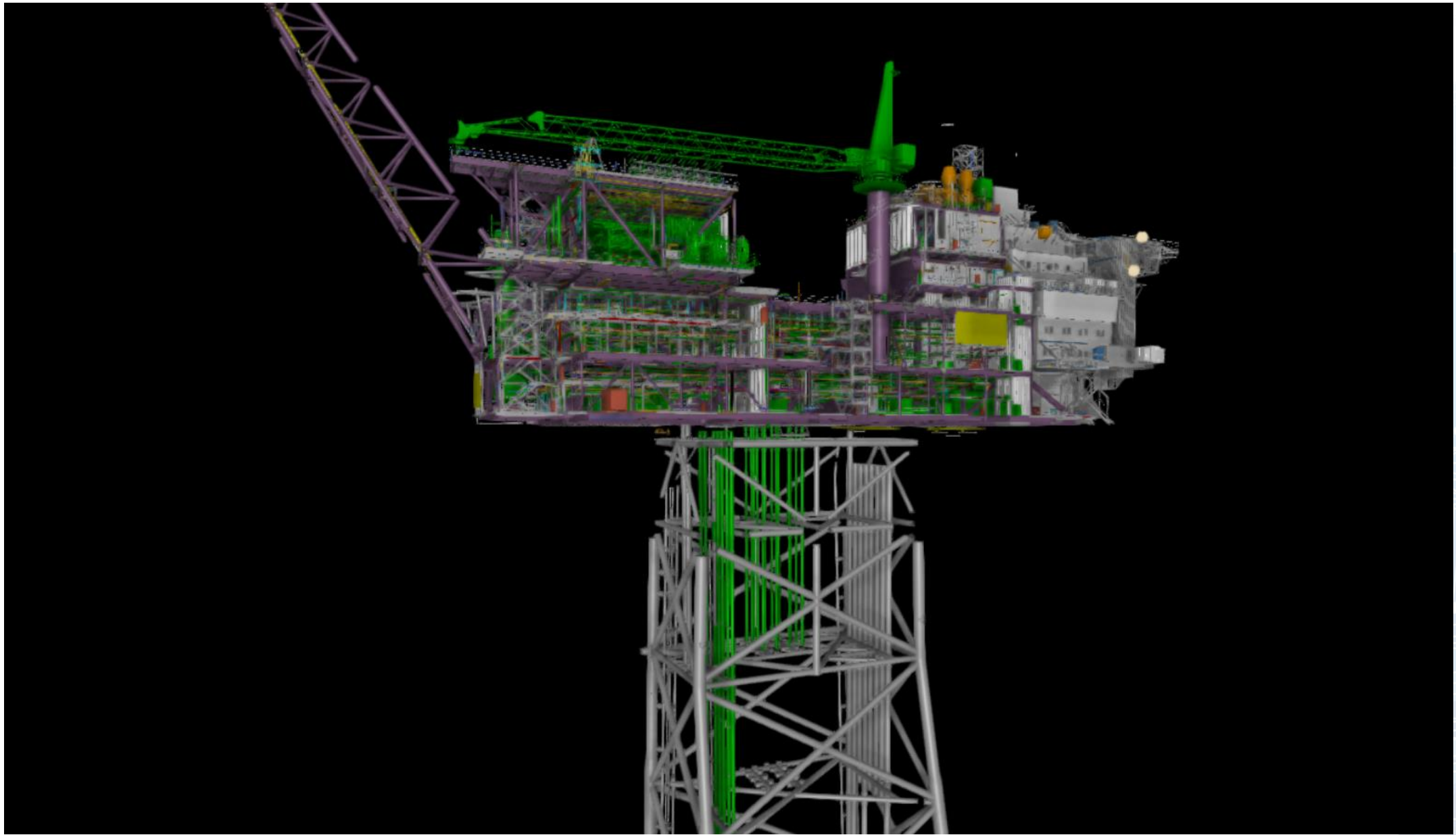
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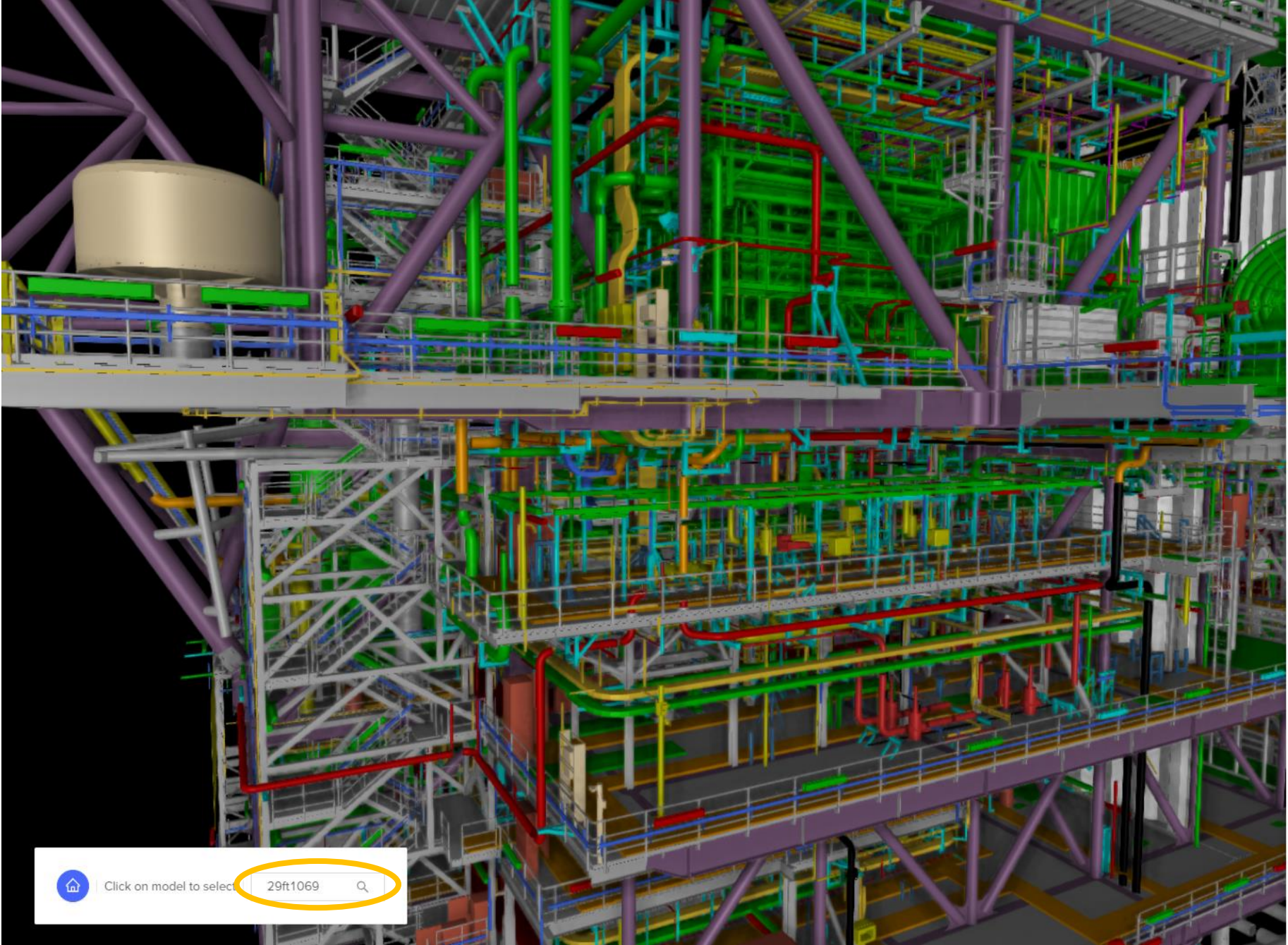
170SQ0002



87JF3032N







Asset details

X

29FT1069

DEAERATOR BST PMP A DISCH

< Details Timeseries Do >

ALLOWEDPRESSURELOSS

AREA

M310

ASSETSCOPENAME

IAA

BACKPRESSURE

CABLECODE

CABLELENGTHINSTALLED

CABLETYPE

CALCULATEDPRESSURELOSS

CALCULATIONLENGTH

CALCULATIONMETHOD

CALIBRATEDRANGEFROM

0

CALIBRATEDRANGETO

1324

CALIBRATEDRANGEUOM

mbar

CHEMICALCLEANINGFLAG

Cognite Asset ID

394069

COLDSETPRESSURE

COMPRESSIBILITYFACTOR

CONTRACTOR

SM

CREATEDBY

1c24370859d0

CREATEDDATE

2018-01-01

CRITICALLINEFLAG

CROSSSECTIONSIZE





Click on model to select

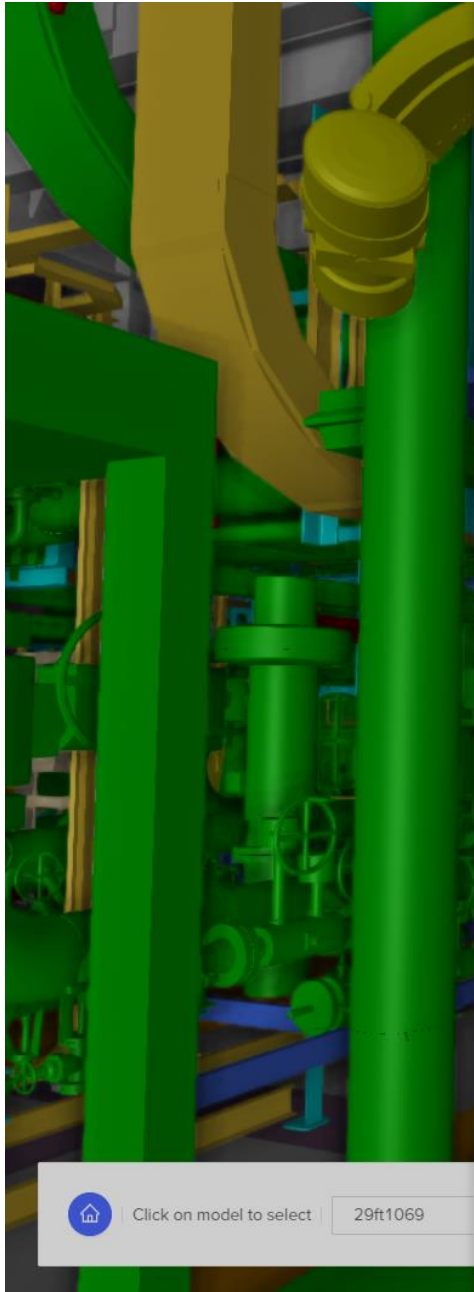
29ft1069

29FT1069

DEAERATOR BST PMP A DISCH

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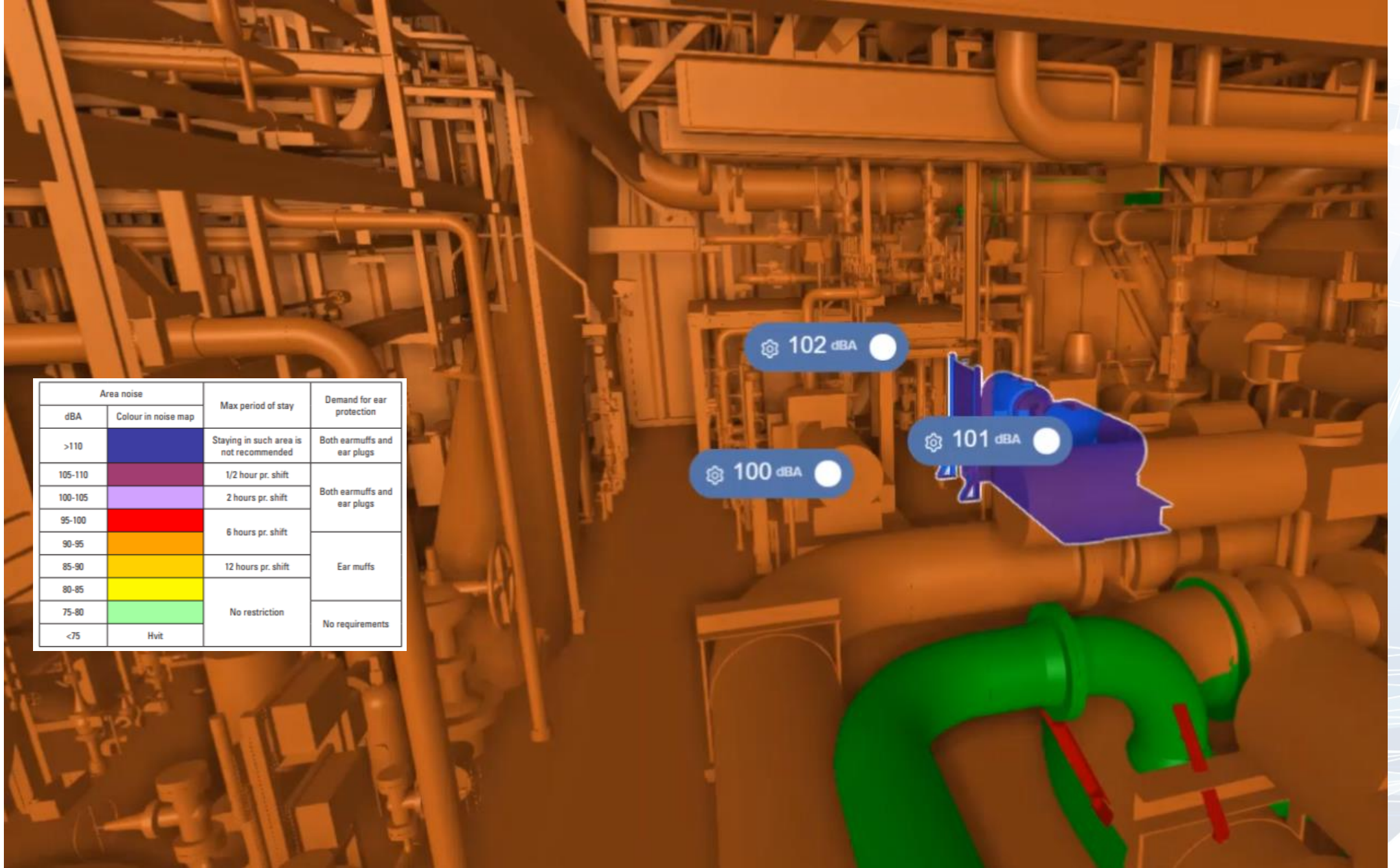
|                        |              |
|------------------------|--------------|
| ALLOWEDPRESSURELOSS    |              |
| AREA                   | M310         |
| ASSETSCOPENAME         | IAA          |
| BACKPRESSURE           |              |
| CABLECODE              |              |
| CABLELENGTHINSTALLED   |              |
| CABLETYPE              |              |
| CALCULATEDPRESSURELOSS |              |
| CALCULATIONLENGTH      |              |
| CALCULATIONMETHOD      |              |
| CALIBRATEDRANGEFROM    | 0            |
| CALIBRATEDRANGETO      | 1324         |
| CALIBRATEDRANGEUOM     | mbar         |
| CHEMICALCLEANINGFLAG   |              |
| Cognite Asset ID       | 394069       |
| COLDSETPRESSURE        |              |
| COMPRESSIBILITYFACTOR  |              |
| CONTRACTOR             | SM           |
| CREATEDBY              | 1c24370859d0 |
| CREATEDDATE            | 2018-0:      |
| CRITICALLINEFLAG       |              |
| CROSSSECTIONSIZE       |              |
| CROSSSECTIONSIZEUOM    |              |



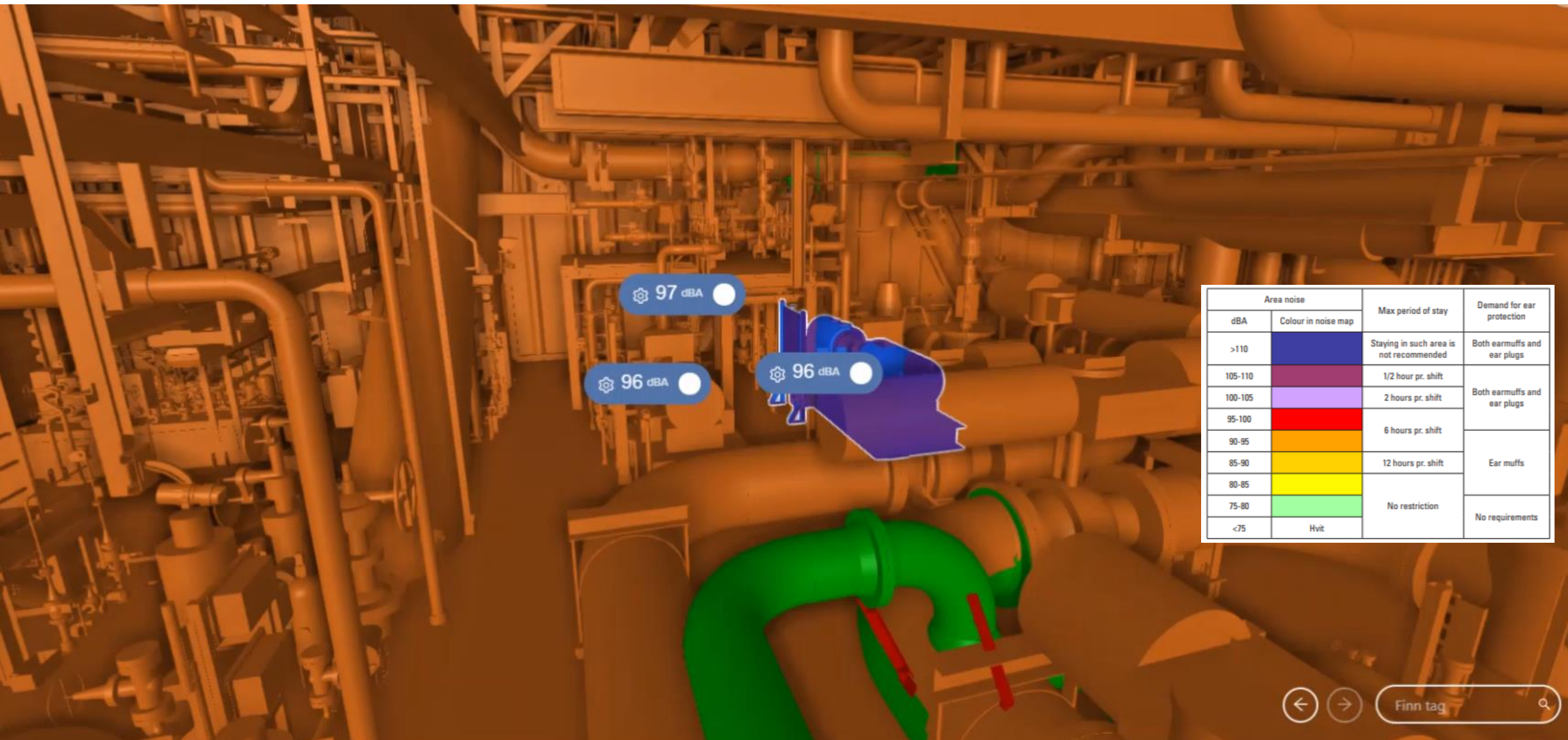
Click on model to select

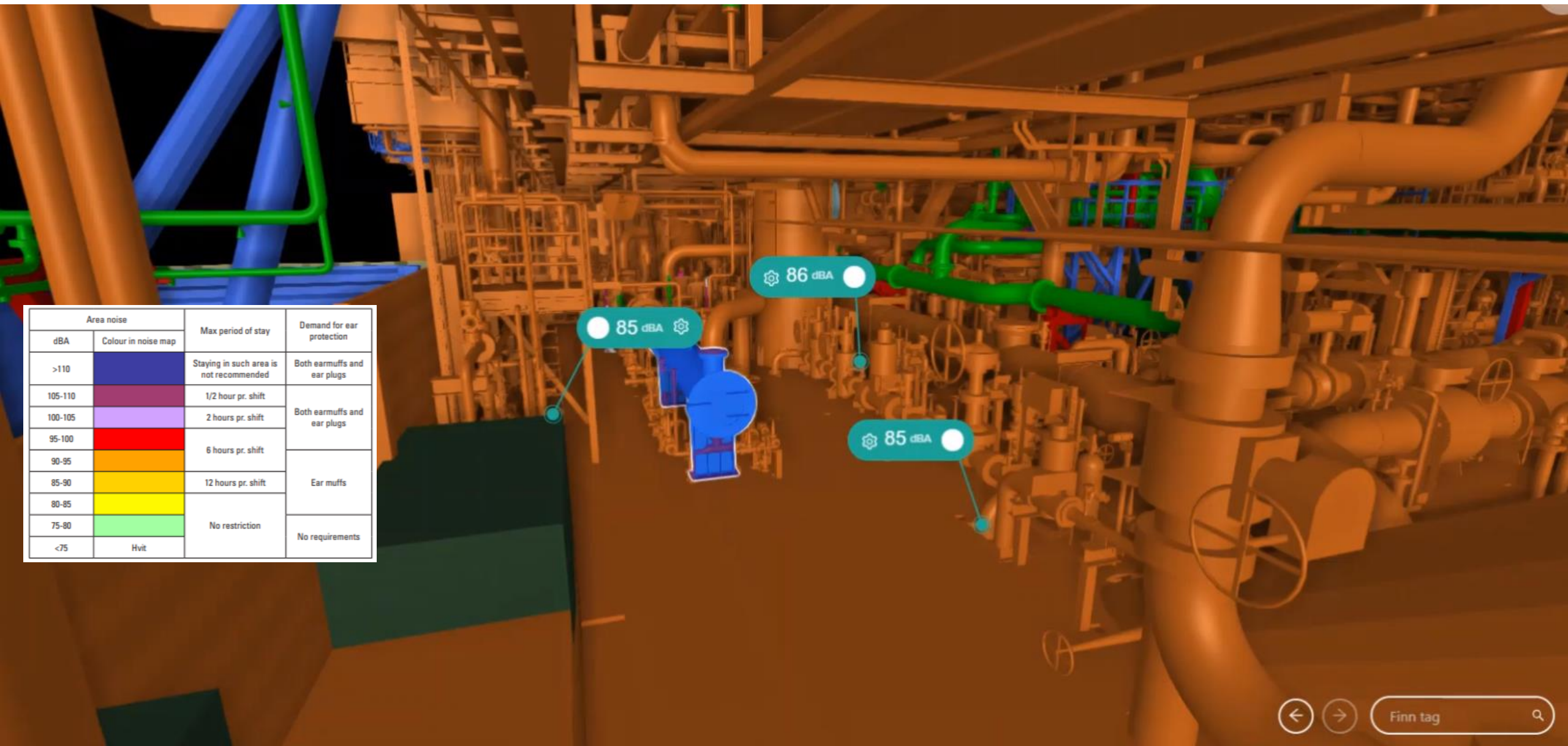
29ft1069







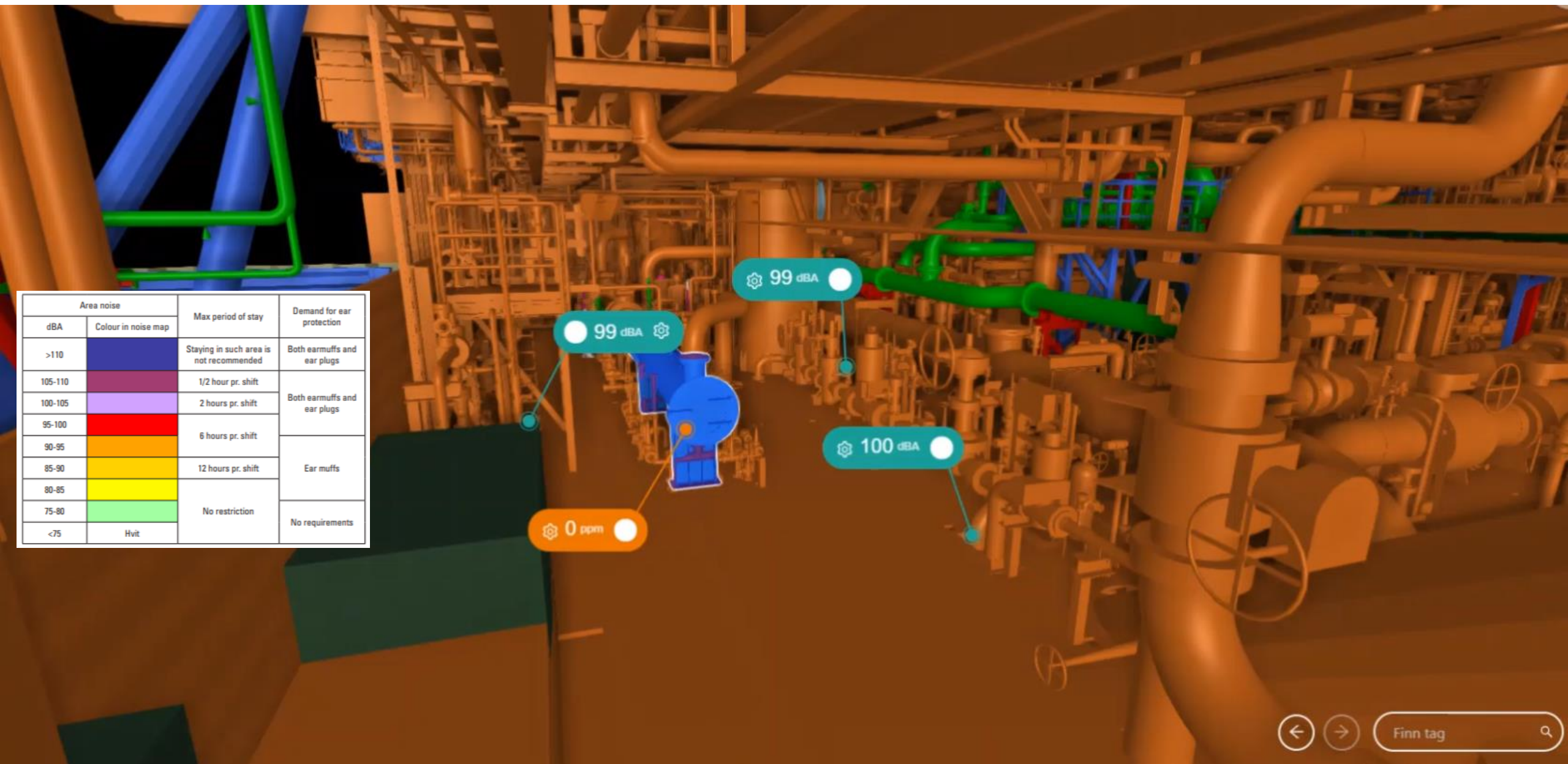




| Area noise |                     | Max period of stay                      | Demand for ear protection   |
|------------|---------------------|-----------------------------------------|-----------------------------|
| dBA        | Colour in noise map |                                         |                             |
| >110       |                     | Staying in such area is not recommended | Both earmuffs and ear plugs |
| 105-110    |                     | 1/2 hour pr. shift                      | Both earmuffs and ear plugs |
| 100-105    |                     | 2 hours pr. shift                       |                             |
| 95-100     |                     | 6 hours pr. shift                       |                             |
| 90-95      |                     | 12 hours pr. shift                      | Ear muffs                   |
| 85-90      |                     | No restriction                          |                             |
| 80-85      |                     |                                         |                             |
| 75-80      |                     | No requirements                         |                             |
| <75        | Hvit                |                                         |                             |



| Area noise |                     | Max period of stay                      | Demand for ear protection   |
|------------|---------------------|-----------------------------------------|-----------------------------|
| dBA        | Colour in noise map |                                         |                             |
| >110       |                     | Staying in such area is not recommended | Both earmuffs and ear plugs |
| 105-110    |                     | 1/2 hour pr. shift                      | Both earmuffs and ear plugs |
| 100-105    |                     | 2 hours pr. shift                       |                             |
| 95-100     |                     | 6 hours pr. shift                       | Ear muffs                   |
| 90-95      |                     | 12 hours pr. shift                      |                             |
| 85-90      |                     | No restriction                          | No requirements             |
| 80-85      |                     |                                         |                             |
| 75-80      |                     |                                         |                             |
| <75        | Hvit                |                                         |                             |





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# Oppsummering

## ■ Enda ikke i mål

## ■ Potesiale:

- Knytte driftsmodus/ parameter til støy
- Kunne bruke Noise Bhoys app til mer enn støy





[www.akerbp.com](http://www.akerbp.com)