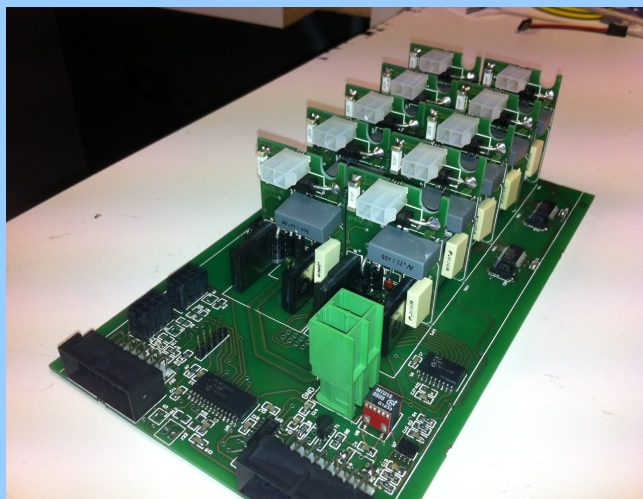


Proposta - Test

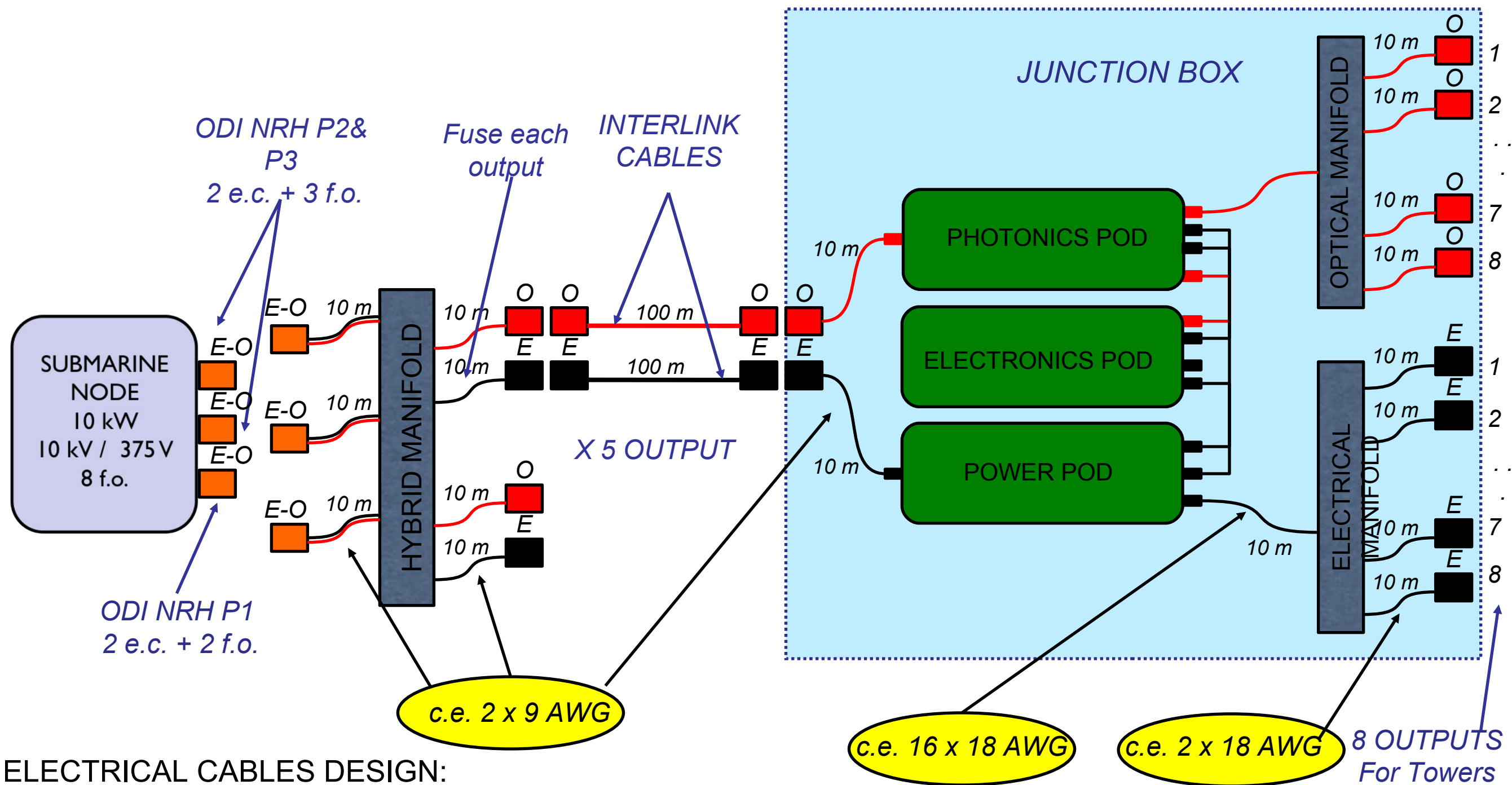
MVC
O
TDK ???

→
Water cooling



8

Power System Layout - from Submarine node to JB

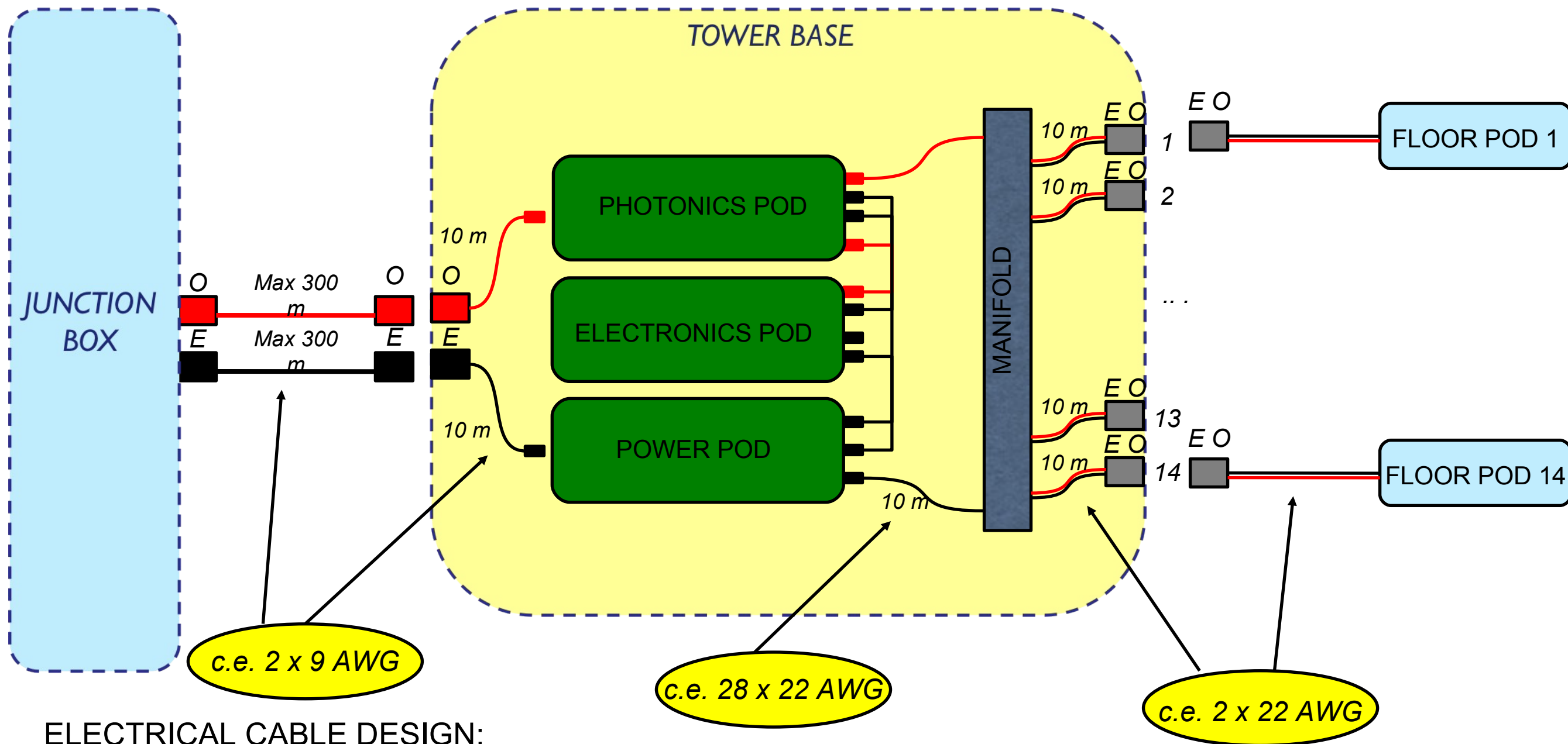


ELECTRICAL CABLES DESIGN:

The submarine electrical cables network has been designed to guarantee a voltage drop from MVC output to the tower upper floor equal to 4%.

The voltage drop from the MVC output to the JB output is lower than 2% using the electrical cables with length and section reported above in yellow and a 3.6 kW electrical load at JB output, calculated for 8 towers + JB.

Power System Layout - from JB to Tower floors



ELECTRICAL CABLE DESIGN:

with the electrical cables cross section reported above in yellow, the voltage drop from the JB output to the tower base is equal to 1% (cable length as reported above, electrical load at tower base equal to 400 W per tower)

We have to add to it the voltage drop from the base tower to the upper floor which is about 1%.

The result is a 4% total voltage drop.

Power POD

The “power POD” is located in the Junction Box; it hosts the portion of power system able to distribute the power coming from the MVC to the users. The users are: 8 towers (or 12 DU), a beacon and all the local electrical loads located in the Power Pod, Electronics POD and Photonics POD.

All the distribution lines are remotely switchable except for the local line that feeds the control system. The communication between the local control system and the shore lab is realized through a FCM board (located in the Electronics POD) via optical fibres.

The Power Pod (PoP) will be oil filled to protect it from water input hence increasing reliability. For this reason all the electronics components present inside the PoP must withstand oil bath.

In the PoP, both the Power Supply System (PSS) board and the Power Control System (PCS) board will be located. PSS and PCS will be used both in the JB and Tower base.

The PSS allows voltage conversion from 375 V, delivered by the MVC, to low voltages required by all the electrical loads.

The PCS allows monitoring and control of: electrical parameters of all the distribution lines, environmental parameters and remote switch actuation. In case of communication loss between PCS and FCM located inside the EIP, the PSB guarantees the output lines feeding, thanks to a time-out system that automatically actuate all the switches of these lines.

Power Supply System Board features

The Power supply Board converts the 375 V to a series of low voltages required by the users; its main features are listed below:

- Working environment: oil bath,
- Protection against input transient overvoltage,
- Soft start outputs (3.3V, 1.8V, 1.2V),
- Flexible start up output sequencing,
- Current and voltage monitoring,
- 50 W maximum total outputs (included DC/DC conversion losses),
- Low output voltage ripple,
- Isolated^d power supply for oceanographic instrumentation.

Power Control Board features

- The Power Control Board is dedicated to the monitoring and control of the distribution lines and PODs ambient parameters; its main features are the following:

- Working environment: oil bath,
- Working voltage 375V DC, max power 5 kW,
- Monitoring of all the input and outputs lines electrical parameters (V, I),
- Monitoring of ambient parameters: temperature, pressure, water ingress,
- Remotely operated switches in all the output lines with a soft start system,
- Communication interface between PSB and FCM via isolated asynchronous serial RS232,
- Output short circuit protection. In case of an output line fuse blow **s** up, the 375 V return will be opened to completely isolate the output load affected by the fault,
- Time-out system that automatically actuate all the switches of the output lines in case of communication loss between PSB and FCM.