

# Pipeline Welding & NDE

## PRODUCT OVERVIEW

*Use of automated welding for efficient high quality pipeline fabrication*



For subsea pipeline projects, Subsea 7 offers clients an inclusive service from specification and procurement of linepipe, fittings and coatings, through qualification of welding processes and non-destructive examination (NDE), to fabrication of reeled or bundled pipelines and risers.

Key elements include:

- Reelable rigid pipelines and risers up to 16" diameter
- Bundled pipelines in continuous lengths up to 7.8km
- Pipe-in-pipe technology
- Narrow gap automated welding for high quality and speed of fabrication
- Automated ultrasonic testing (AUT) to complement automated welding process
- Field Joint Coating (FJC) systems to optimise corrosion and insulation performance
- Versatile fabrication and loadout facilities at spoolbases strategically located around the world
- Project and facilities management expertise
- Training capability to qualify local workforces

For each pipeline fabrication project, Subsea 7 combines input from materials, welding, NDE and coatings engineers with the use of facilities available at its pipeline development centre to fully assess the specification, welding, testing and FJC requirements. Clients are encouraged to be proactive in this pre-production process to ensure that the end result is a pipeline or riser which is truly fit-for-purpose on their project.

Many welding processes are available and selecting an appropriate procedure for a particular weld is dependent on a variety of factors which may include: material specification and weldability; pipeline or riser service and design conditions; pipe diameter and wall thickness; quantity of welds; pipeline installation method; available welding equipment and consumables; existing welder qualifications; available NDE processes; factory coating; available FJC systems; possible lining requirement; and available firing line configurations.

All welds are subjected to NDE and nowadays, AUT is generally used for the NDE of welds produced by automated processes. Weld acceptance criteria are established by means of an engineering criticality analysis (ECA). Sufficient lead time is required to carry out the ECA and validate the AUT. Thereafter, precise and efficient weld examination on the production line is ensured. Where necessary, other recognised NDE methods can be applied, for example manual ultrasonic testing; radiography; magnetic particle inspection; and liquid penetrant inspection.

Our spoolbases for fabricating pipelines are strategically located in: Luanda, Angola; Ubu, Brazil; Vigra, Norway; Wick, UK; and Port Isabel, USA (opening in June 2009). Experience and technology is available for delivering: reelable rigid pipelines up to 16" diameter; bundled pipeline lengths up to 7.8km; reelable pipe-in-pipe; corrosion resistant alloy pipelines; polymer lined pipelines; and steel catenary risers (SCRs).

Subsea 7 also has significant experience of training and qualifying local personnel for operating spoolbases under the control of skilled corporate management teams. This allows for a high local content to be introduced to each pipeline fabrication project.



J-bevel and counterbore weld preparation for SCR fabrication

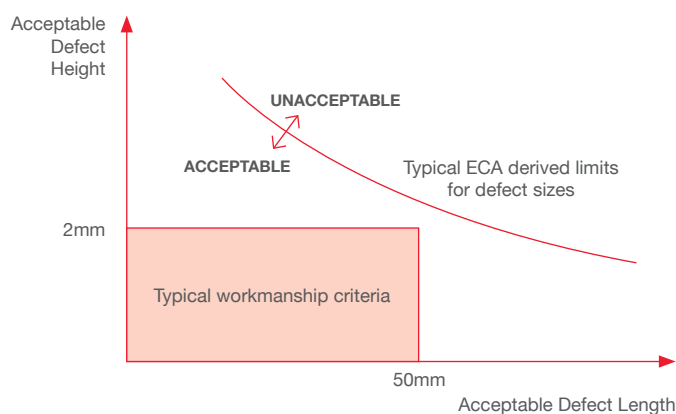
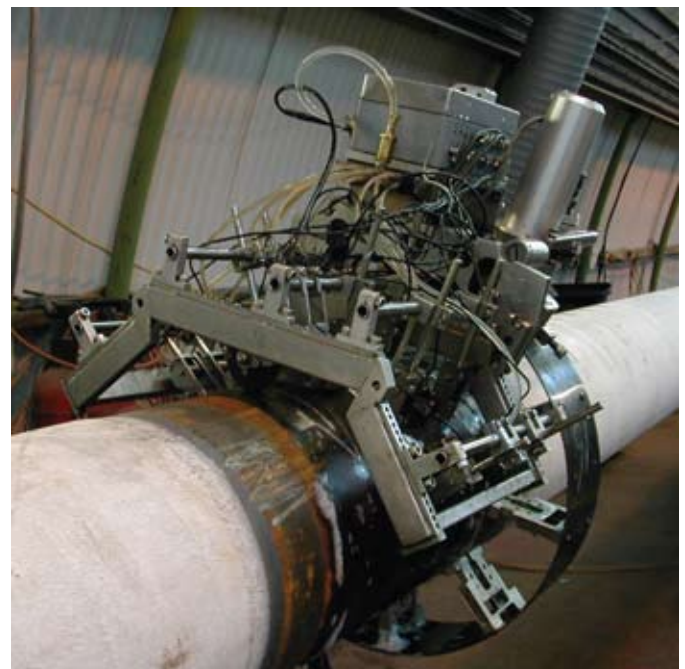


Illustration of typical ECA derived weld acceptance criteria



AUT scanner orbiting completed pipeline girth weld on production line

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