

	Karish & Tanin Field Development Plan		ISR-GEN-RP-PJM-0025
			Revision: A Date: XX.XX.2017
	Page 383 / 445		

8 Project Schedule and Costs

8.1 Project Schedule and key milestone

8.1.1 Project schedule & Critical Path

The main schedule milestones for the Karish FPSO and Subsea Development project are as follows:

- Subsea Pre-FID Engineering Design contract award: end May 2017
- Selection of hull fabrication yard: July 2017
- Selection of topsides and integration yard: July 2017
- Geotechnical, geophysical and Environmental Base Line Survey: July 2017
- Approval of FDP by Israeli government: August 2017
- Selection of rig and drilling services contractors: August 2017
- Award of EPCmIC contract: October 2017
- Completion of full project EIA (ESIA): October 2017
- ITT's issued for identified Long Lead items
- Project sanction: end 2017
- Award main project contracts: January 2018
- Commence hull fabrication: Q1 2018
- Commence drilling operations: Q3 2018
- Commence FPSO hull topsides integration and commissioning: Q2 2019
- Complete drilling operations: Q2 2019
- Commence pipeline installation: Q2 2019
- Undertake SURF pipeline installation: Q3 2019
- Mobilise FPSO from Asia to Europe: Q4 2019
- Hook-up FPSO to SURF and pipeline: Q1 2020
- Final commissioning and start-up: Q1 2020
- First gas sales: April 2020
- First oil sales: June 2020

Detailed schedules for the FPSO fabrication scope and the offshore construction and installation scope are included as attachments to the FDP. A full integrated schedule including drilling etc. will be prepared and risked in the next phase. The project will involve the timely evaluation and award of major contracts and purchase orders.

Critical Path activities have been identified as:

- FPSO Hull
- FPSO Topside Modules
- Subsea Manifold
- Subsea Xmas Trees

To be able to meet the First Gas dates the procurement of long lead items (detailed in subsequent section) will need to be procured in a timely manner.

8.1.2 Long lead items

8.1.2.1 SURF and FPSO Long Lead items

A Long Lead Item (LLI) register for major equipment has been developed in order to de-risk the schedule as project progresses. LLI's are defined as equipment or materials with a lead time of 12 months or more. This allows the project management team to identify lead times for major equipment and build it into the engineering, procurement and construction (EPC) schedule and activity sequencing, thus mitigating schedule risk as much

as possible. Major equipment lead times are shown below and will be categorized according to their lead time and criticality.

Table 8-1: Facilities and SURF long lead items

Equipment	Delivery time ex works (months)	LLI	Source of estimate*
Process Equipment and Systems			
Separation Vessels (incl. coalescer)	10-13	Y	Experience based
LP Gas Compressor (Electric motor)	12	Y	Supplier input
Export Gas Compressor (Electric Motor)	12-14	Y	Supplier input
Export Gas Compressor (Gas Turbine)	12-14	Y	Supplier input
Choke valves	12	Y	Experience based
Electrical Systems			
Emergency Generator (diesel)	12-14	Y	Experience based
VSDs	12	Y	Procurement Database
Gas Turbine Generators	12-14	Y	Supplier input
Marine (utility) Systems and Hull			
Hydraulic Power Unit	12	Y	Procurement Database
Main cranes	14	Y	Supplier input
Cargo, seawater, ballast and firewater pumps	12	Y	Supplier input
Free fall lifeboats	10-12	Y	Supplier input
Offloading system	12	Y	Supplier input
Riser pull-in system	12-14	Y	Supplier input
Mooring pull-in winch and chain stoppers	12-14	Y	Supplier input
Mooring lines	12-14	Y	Supplier input

8.1.2.2 Drilling Long Lead items

The table below summarizes the long lead well construction equipment. The longest lead item is the EHXT (Enhanced Horizontal Christmas Tree) from TechnipFMC with a 17-month lead-time. This gives an estimated ready date for all equipment of 1st January 2019. It may be possible to commence operations sooner than this date, particularly if the wells are to be batch drilled down to the setting of the production casing.

Table 8-2: Drilling long-lead items analysis

Item	Description	Source of Information	Lead Time
Wellhead	TechnipFMC	TechnipFMC	8 months
Xmas Tree	EHXT	TechnipFMC	17 months
Conductor			6 months
20" Casing	147# / K-55	Tenaris	9.5 months
13-5/8" Casing	88.2 # / Q-125	Tenaris	7 months
10-3/4" casing	65.7 # / Q-125	Tenaris	7 months
9-5/8" Casing	53.5 # / Q-125	Tenaris	7 months
9-5/8" Casing	53.5 # / TN 125Cr13S	Tenaris	12 months
Float equipment		Weatherford	10 – 15 weeks
OHGP (Single Zone)	OHGP Equipment	Schlumberger	6 months ex. works
7" & 5-1/2" production Tubing		Vallourec	9 months ex. works
Permanent Packer	Production Packer	Schlumberger / Baker Hughes	6 months ex. works
Upper Completion Equipment		Schlumberger / Baker Hughes	6 months ex. works