From: [redacted]
Sent: Thursday, 13 February 2020 2:17 PM
To: [redacted]
Cc: [redacted]
Subject: INPEX- Inspection RMS:1960
Attachments: X060-AH-TCN-70000ongoing flaring .docx; Recommendations Follow Up List for Operator Response 2 Dec 2019.xlsx; 30D IAP - 24-Jan-20.pdf; X060-AH-CNO-70000 [redacted]

Hi [redacted]
Just following up on the proposed actions we provided for inspection 1960 via the upload site.
Please find relevant evidence of action close out:

- 1960-1 – 2020 Monthly/Annual Flaring Targets (attached)
- 1960-2 – i) Integrated Activity Plan (attached with highlighted sections for OFG and Flashgas)
- 1960-2 – ii) Tech Note / New Enviro Impact Assessment – ongoing flaring

[redacted]

NOPSEMA	ID	1960-1
	Recommen-dation	Consider updating assumptions for the calculation of monthly and yearly flaring targets to incorporate additional steady-state flaring volume data.
	Status	Open
		Please provide your response below
Titleholder	**Response**	
	Action	**INPEX will incorporate a revision of the assumptions for the calculation of monthly and yearly flaring targets to include additional representative data obtained during November 2019 to establish the 2020 Flaring targets.**
	Position	[redacted]
	Due Date	15/01/2020

NOPSEMA	ID	1960-2
	Recommen-dation	Ensure that a revised time frame for the commissioning of emissions reduction technologies has been established, and in the interim, consider revising the flaring approval process to include an evaluation of potential environmental impacts and risks associated with continuous flaring.
	Status	Open
		Please provide your response below
Titleholder	**Response**	
	Action	**1. INPEX will include the revised commissioning timeframe for the Flash gas compressors and the off-gas compressors within the Integrated activity plan (30 day look ahead).** **2. Prepare a technical note to evaluate the potential environmental impacts and risks associated with continuous flaring.**
	Position	[redacted]

	Due Date	15/01/2020

[redacted]

Regards

[redacted]

NEW ENVIRONMENTAL INFORMATION RISK ASSESSMENT-FLARING

Technical note

Document No.: X075-AH-TCN-70000
Security Classification: Restricted

Rev	Date	Description	Prepared	Checked	Line Manager endorsed
A	02/12/19	For review	[redacted]	[redacted]	[redacted]

Document distribution

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Notice

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1 INTRODUCTION

The in-force EP assumed that after the first 12 months of production INPEX would have completed commissioning and start-up procedures for all equipment. There are several packages (e.g. Fuel-flash gas compressors and off-gas recovery compressors) that were not commissioned on the CPF and FPSO when the 12 month period expired on 27 July 2019. This is resulting in unplanned flaring on a continual basis until such time as all the emissions reduction packages are operable. Once all the packages are commissioned flaring will only occur during upset conditions.

Table 7-2 and Table 7-3 of the in-force EP assesses the risks and impacts of atmospheric emissions and light from flaring. In both risk assessments the controls include the use of equipment to ensure that flaring is reduced assuming that it is not occurring on an ongoing basis.

This new information assessment will consider at the risk assessments presented in the Accepted EP in the context of flaring continually to determine whether the risks are still being managed to ALARP and acceptable levels. The assessment also considers information recently made available via industry consultation on the *Draft National Light Pollution Guidelines for Wildlife Including marine turtles, seabirds and migratory shorebirds* (REF).

2 Risk assessment

2.1 Hazard/threat

Flaring will be continual until the flash-gas recovery and off-gas compressions units are commissioned. As such light emissions are expected to be constant for several months.

Light emissions associated with flaring have the potential to expose light sensitive marine fauna, to changes in ambient light levels that could lead to behavioural changes. Marine turtles and marine avifauna can be particularly sensitive to light emissions. Flaring in a constant manner may potentially result in light emissions that are detectable at Browse Island (33km from the facility), which is the nearest known aggregation area for marine turtles and marine avifauna. Further, a green turtle internesting buffer is present, extending 20 km around Browse Island (DEE 2017).

In addition, atmospheric emissions produced from continual flaring will contribute to localised changes in air quality and subsequent exposure of marine avifauna to air pollutants.

2.2 Consequence

The particular values and sensitivities identified as having the potential to be impacted by light emissions from flaring are:

- marine turtles (including the green turtle BIA at Browse Island)
- marine avifauna.

The in-force EP assessed the possibility that light would be visible from the flare(s) at Browse Island. However, the consequence assessment concluded that the potential effect of direct light from the flare tip or glow from deck facilities is mitigated by the reduction in intensity of light, which diminishes with the square of the distance (i.e. light is reduced to one-hundredth of the initial intensity after 10 m, one ten thousandth after 100 m, etc.) and by the spectral range of the emitted light. Gas flares emit measurable light energy over the whole range of visible and near infrared wavelengths, with peak intensities in the spectral range from 750 to 900 nm (Hick 1995) while the most disruptive wavelengths to turtles are in the range of 300 to 500 nm (Tuxbury & Salmon 2005; Witherington 1992). Therefore, the glow visible at Browse Island was considered to be too low and primarily of the wrong spectral range to cause any disturbance to turtles. The in-force EP assessment also noted that while turtle hatchlings primarily use light cues to orient to water, once in the water they rely on sea-wave and magnetic cues for orientation (Witherington & Martin 1996; Lohmann & Fittinghoff-Lohmann, 1992; Environment Australia 2003), therefore further limiting any potential impacts of light from flaring once turtles have reached the ocean.

Although light emissions from flaring may be visible at Browse Island and from within the interesting buffer, significant exposure or changes in ambient light levels are not expected to affect the behaviour of the marine turtle population at this area (whether the light from the flare is continual or intermittent).

This assessment was confirmed by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC 2008) through the formal environmental assessment process, indicating that the risk of light spill adversely impacting any listed threatened species is low. The offshore light source created by the flare is not expected to have a discernible effect on adult turtles' or hatchlings' abilities to orientate to water at Browse Island and the potential for light from flaring to attract marine turtles once they are at sea is expected to have an inconsequential ecological significance (Insignificant F).

The in-force EP also assessed Browse Island as an important location for marine avifauna based on stakeholder engagement consultation.

There are no known marine avifauna BIAs within 100 km of the CPF/FPSO; however, marine avifauna breed at Browse Island and a number of migratory marine avifauna species may transit near Zone 1 during their migration via the EAA Flyway.

As stated in Table 7-2 of the in-force EP, temporary increases in combustion emissions may occur during flaring, this is not expected to result in a significant increase in exposure of atmospheric emissions to marine avifauna, as they are expected to avoid the immediate area surrounding the flares. Whilst commissioning of emissions reduction equipment may take a few months longer than planned, no additional impacts to marine avifauna are expected during this ongoing commissioning period.

Marine avifauna are highly visually orientated and impacts on large flocks of birds, including fatalities, have previously been documented on oil platforms. However since the facility has been flaring for over 12 months and there have been no flaring related fauna deaths (or any other significant fauna events reported) the actual consequence from the light and/or atmospheric emissions to marine fauna in the Ichthys Field is considered to be insignificant. (Insignificant F) given that there have been no fauna related fatalities reported. Therefore, the consequence for both light impacts and air impacts to marine avifauna remain Insignificant (F).

2.3 Likelihood assessment

While it is certain that the light and atmospheric emissions will be emitted until the equipment is commissioned, the likelihood of impact to turtles or marine avifauna remains Highly unlikely (5) given the incremental increase in light and atmospheric emissions.

2.4 Residual Risk

Residual risk remains Low (10)

2.5 Controls

A production optimisation meeting has been established to ensure the emissions reduction equipment is commissioned and operating as soon as reasonably practicable.

The Flaring Management Plan requires that if flaring is to be conducted for >72 hours, the [redacted] must provide approval. The use of this control continually raises the profile of the issue and ensures that it is maintained as a high priority for the business.

It may be possible to measure the light impact at Browse Island in order to determine the actual light spill, however this control is not considered reasonable given the high cost, difficultly of access at Browse island and that it does not reduce the an already insignificant impact.

2.6 Acceptability

2.6.1 Legislative requirements

All Legislative requirements have been met. No change.

2.6.2 Stakeholder consultation

No impact to stakeholders as events limited to Zone 1.

2.6.3 Conservation management plans / threat abatement plans

Draft National Light Pollution Guidelines for Wildlife Including marine turtles, seabirds and migratory shorebirds was released for comment in September 2019 by DEE. The document states that "natural darkness has a conservation value in the same way that clean water, air and soil has intrinsic value" and that artificial light has the potential to stall the recovery of a threatened species. For migratory species, the impact of artificial light may compromise an animal's ability to undertake long-distance migrations integral to its life cycle.

The Ichthys Project EIS considered lighting impacts in the design phase of FPSO and CPF. The facility has been designed and constructed in a manner which reduces light output from flaring. Although the facility has been delayed in meeting the planned schedule of commissioning for flare reduction equipment and is contributing more light than planned for, the management intent remains consistent with the draft lighting guideline, in that INPEX is implementing controls to avoid disruption within or displace important habitat and prevent disruption to critical behaviours.

2.6.4 ALARP Summary

Whilst it may be possible to measure and verify light emissions at Browse Island, the only practicable control to eliminate (or significantly reduce) the light emissions reaching Browse Island, and reduce flaring induced atmospheric emissions is the commissioning of the emissions reduction equipment.

Therefore, with the additional processes in place to expeditated and track the completion of commissioning of emissions reduction equipment the risk remains ALARP.

2.6.5 Acceptability summary

Based on the above assessment, the proposed controls are expected to effectively reduce the risk of impacts to acceptable levels because:

- the controls demonstrate compliance with legislative requirements
- the controls are consistent with stakeholder expectations
- the controls are aligned with the relevant conservation management plans / threat abatement plans.
- the level of residual environmental risk was assessed to be "Low" and impacts and risks are ALARP, and no further controls can reasonably be implemented to further reduce the risk of impact.

3 OUTCOME

No change to the EP is required. Additional processes are being implemented to ensure critical equipment is commissioned as soon as practicable to reduce light and air emissions from flaring.

The annual reporting obligation (to report on whether the annual flaring target was achieved or not) is likely to be breached in the December period and will be recorded as an event in January 2020.

NOPSEMA	ID
	Recommen-dation
	Status

Titleholder	Response
	Action
	Position
	Due Date

NOPSEMA	ID
	Recommen-dation
	Status

Titleholder	Response
	Action
	Position
	Due Date

NOPSEMA	ID
	Recommen-dation
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Titleholder	Response

	Action
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	Due Date

NOPSEMA Recommendations and Follow-Up List

1960-1
Consider updating assumptions for the calculation of monthly and yearly flaring targets to incorporate additional steady-state flaring volume data.
Open
Please provide your response below
INPEX will incorporate a revison of the assumptions for the calculation of monthly and yearly flaring targets to include additonal representative data obtained during November 2019 to establish the 2020 Flaring targets.
[redacted]
15/01/2020

1960-2
Ensure that a revised time frame for the commissioning of emissions reduction technologies has been established, and in the interim, consider revising the flaring approval process to include an evaluation of potential environmental impacts and risks associated with continuous flaring.
Open
Please provide your response below
1. INPEX will include the revised commissioning timeframe for the Flash gas compressors and the offgas compressors within the Integrated activity plan (30 day look ahead). 2. Prepare a technical note to evaluate the potential environmental impacts and risks associated with contiuous flaring.
[redacted]
15/01/2020

[redacted]

Please provide your response below

Ichthys (IAP) Integrated Activity Plan

Level 2 - 30d IAP All Assets Overview

Print Date: 24-Jan-20

SAP Work Order No	Activity Name	Start	Finish
	Ichthys Explorer (CPF)		
	Offshore Facilities		

9 | Jan 26 | Feb 02 | Feb 09 | Feb 16 | 23

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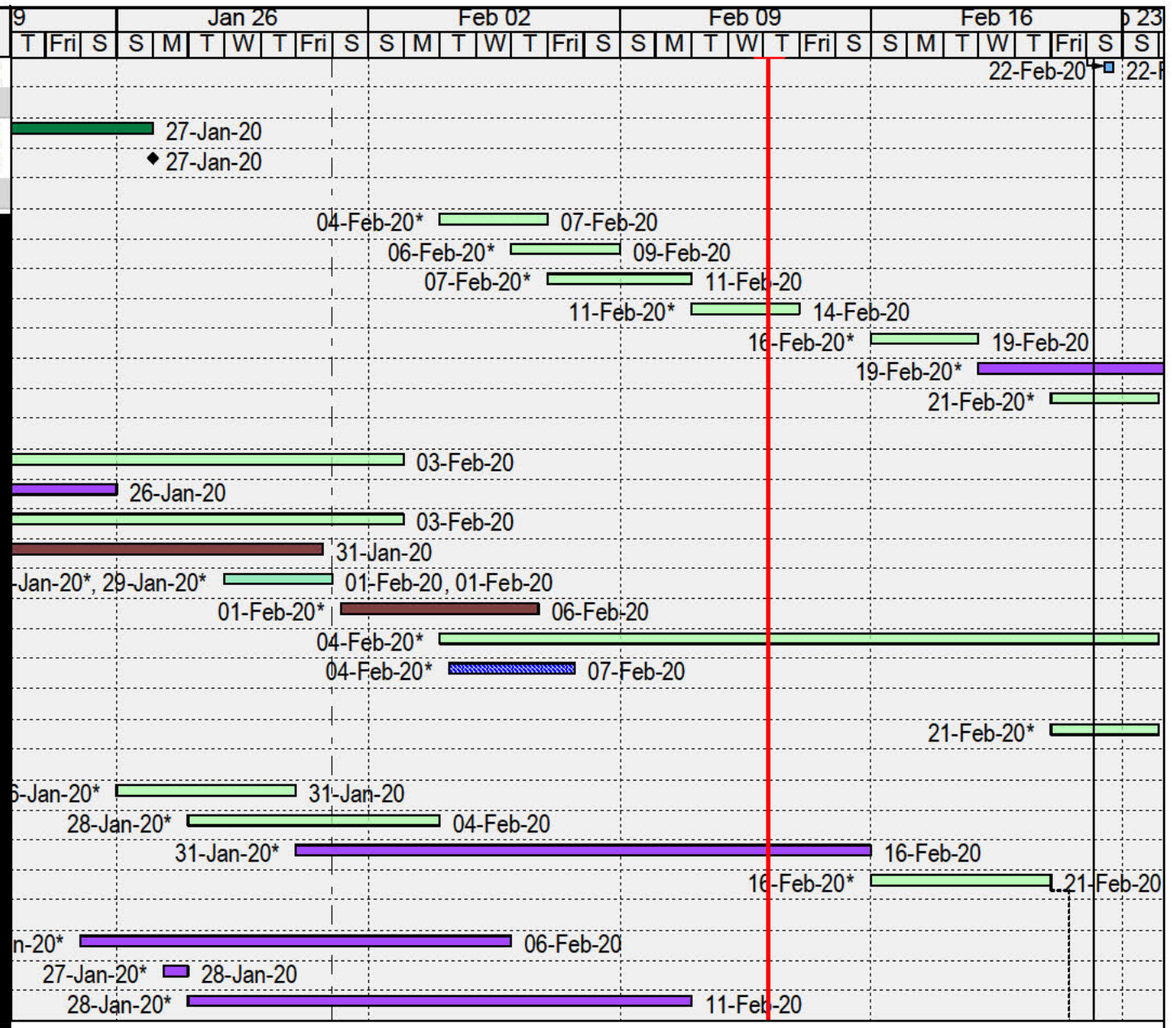
OPERATIONS TEAM
OFFTAKE
PROJECT
CAMPAIGN
Trials
BROWNFIELD
Milestone
% Complete

EPS Layout: IAP Overall View
Layout: IAP - CPF 30D Publish
TASK filters: Completed - Removed, IAP - Date Range = CD + 1m, IAP - Visible, IAP-PSP = 30D.

Date	Revision	Checked	Approved
24-Jan-20	Rev.0 Issue for Use	PSP Group	[redacted]

SAP Work Order No	Activity Name	Start	Finish
2200048008	6M BDC4 - XT Safety Valves - Fnc & Leak Tests (BDC4-03)	22-Feb-20	22-Feb-20
Off Gas Recovery Compressor			
	Offgas Recovery Compressor Commissioning - Summary	09-Dec-19	27-Jan-20
	MS10 - Off Gas Compressor Ready for Use		27-Jan-20
Utility System			



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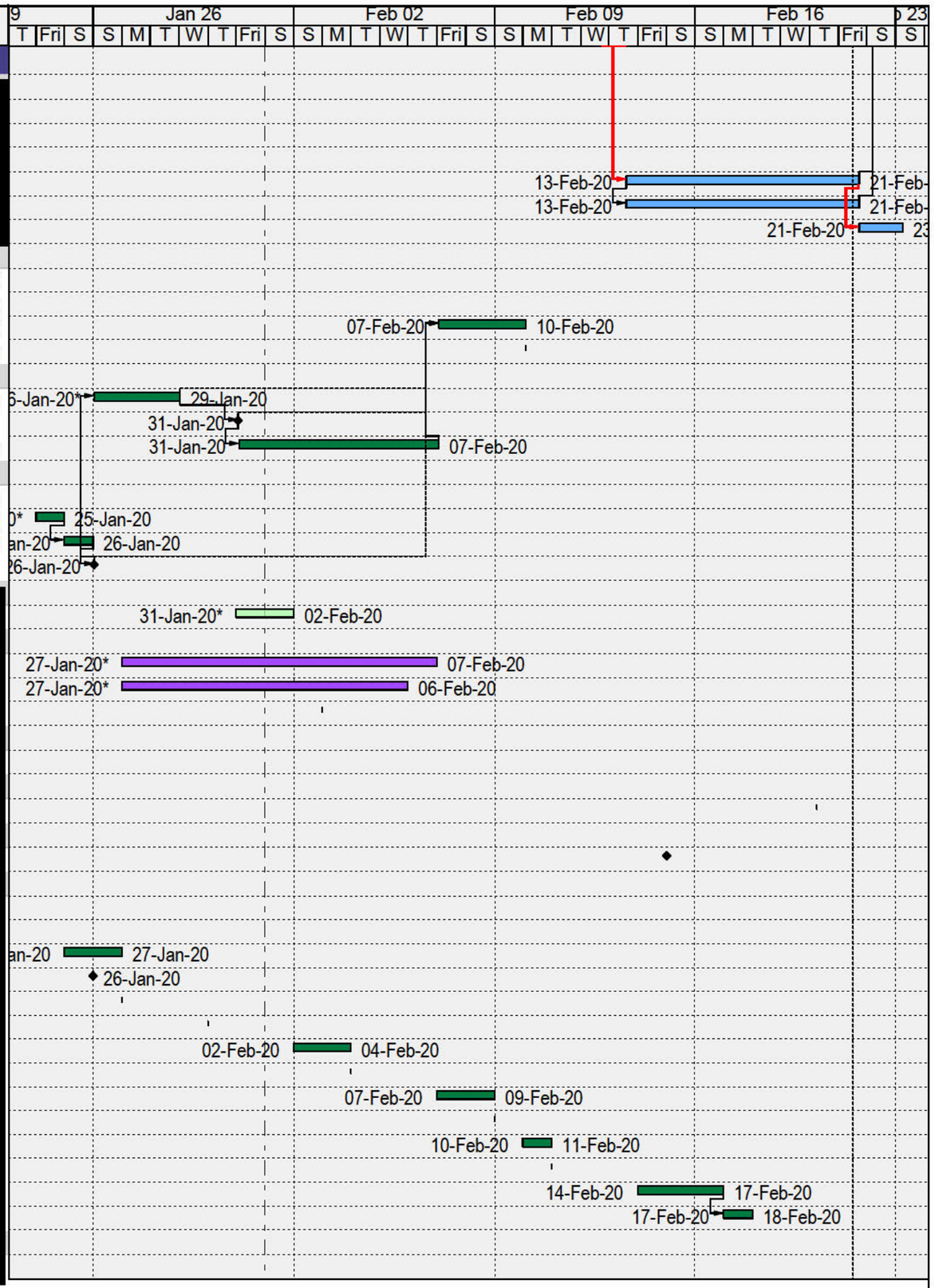
Date	Revision	Checked	Approved
24-Jan-20	Rev.0 Issue for Use	PSP Group	

SAP Work Order No	Activity Name	Start	Finish
Ichthys Venturer (FPSO)			
[redacted]			
FGC Train 1			
	FGC Train 1 Hot Comms - LP / MP / IP - Incl load run test, mapping and 72 hour run tests	15-Jan-19 A	13-Feb-20
	FGC Train 1 - Testing Summary (Inc Tuning / Auto Restart / 72 Hr Run)	07-Feb-20	13-Feb-20
	FGC1 - Full train run and tuning	07-Feb-20	10-Feb-20
	FGC1 full train - GE 72 Hour run test	10-Feb-20	13-Feb-20
FGC - MP1			
	Trial Run (TBC - Following BN Card Repair)	26-Jan-20*	29-Jan-20
	Decision Point Following Review of Vibration Data	31-Jan-20	
	MP1 Logic Change & Vibration Sensor Engineering + MoC (Permanent installation)	31-Jan-20	07-Feb-20
FGC Train 2			
	FGC Train 2 Hot Comms - LP / MP / IP - Incl load run test, mapping and 72 hour run tests	09-Jul-19 A	26-Jan-20
	FGC2 - Full train run and tuning (Full load) Baseline CPF Vibration Readings	24-Jan-20*	25-Jan-20
	FGC2 - Full train run and tuning (Full load) CPF Flow Biasing Trial	25-Jan-20	26-Jan-20
	FGC2 - Decision Point - Partial load or Full Load	26-Jan-20	
[redacted]			



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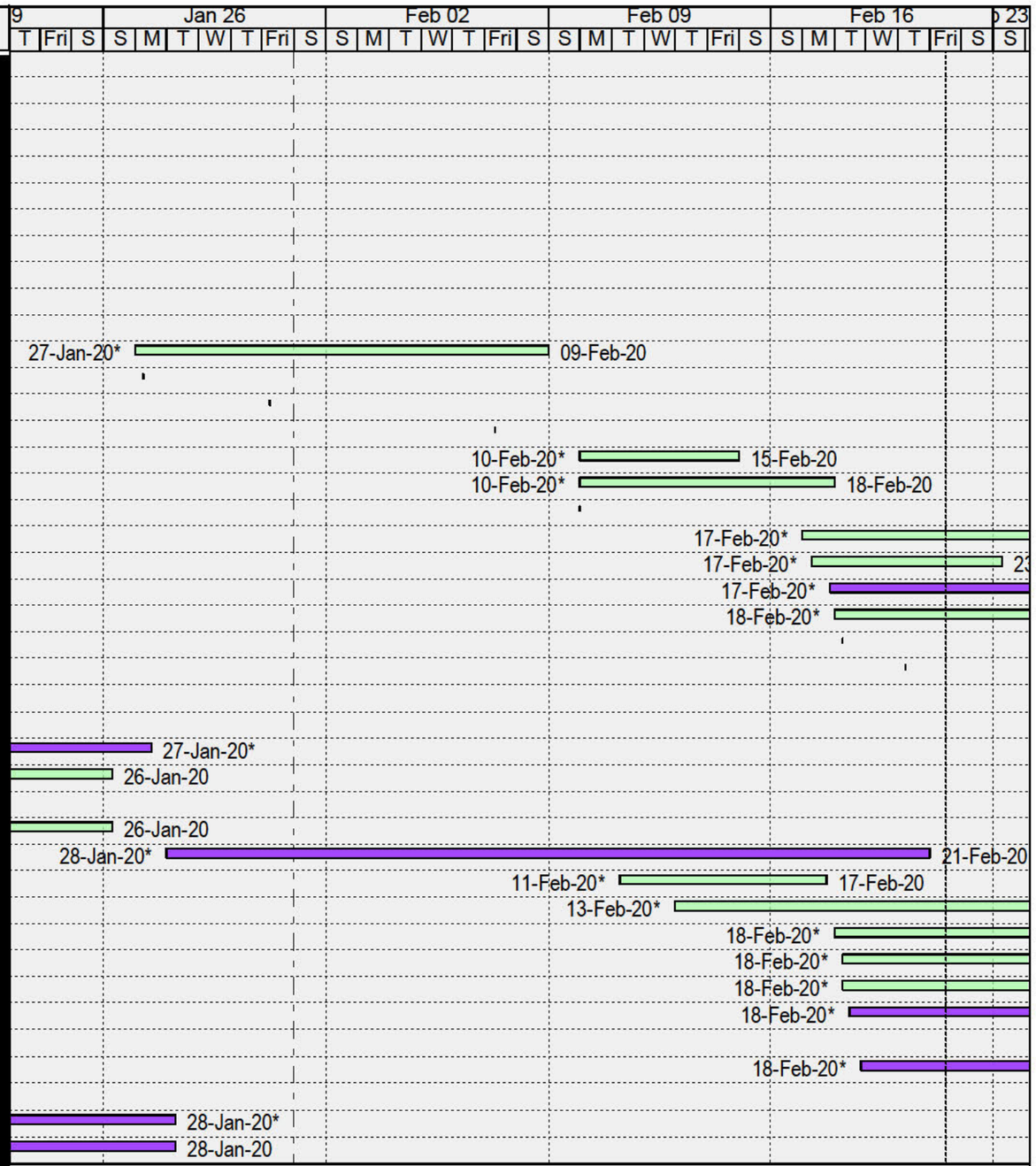

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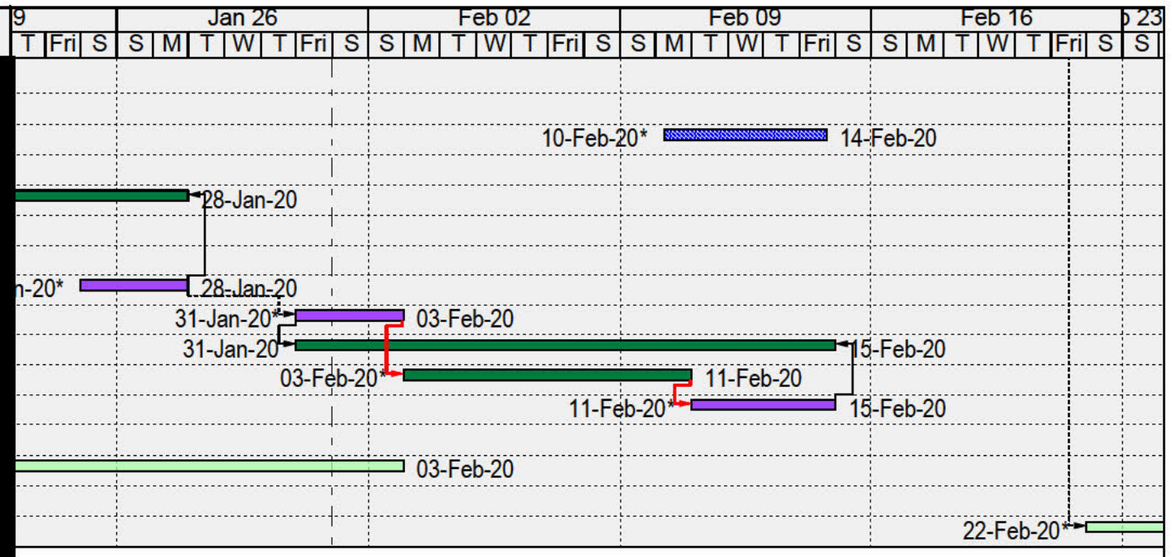

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Date	Revision	Checked	Approved
24-Jan-20	Rev.0 Issue for Use	PSP Group	[redacted]

[redacted]

Security Classification: Restricted
Revision: 0

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