|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **EVENT REPORT: SOKU GAS PLANT TRIP** | | | | | | | | | | | | | | | |
| 1. WHAT IS THE PROBLEM? | | | | | | | | | | | | | | | |
| Title: Soku Gas plant tripped on the 18th of April 2021 at 0415hrs. | | | | | | | | | | | | | | | |
| Date Occurred: 18th April 2021 | | | | Time: 0415hrs. | | | | | | | Location: Soku Gas Plant | | | | |
| Date Reported: 18th April 2021 | | | | Time: 0415hrs. | | | | | | | Reported by: | | | | |
| **Event Type** | | Potential Threat (not yet occurred)  Reliability/integrity – Trip | | | | | | | | | Reliability/integrity – Equipment failure  Reliability/integrity – Others | | | | |
| Equipment Tag Number: Soku Gas Plant (G8101 GG-Solar 1) | | | | | | | | | | | | | | | |
| Background:  Soku Gas plant was operating in a steady state, exporting Gas and Condensate to NLNG and Bonny terminal respectively. The plant was exporting circa 285MMscfd of gas and condensate production of 16kbpd.  The plant experienced power outage due to tripped from G-8101. The plant was restarted at 1030hrs. LP NAG was started at 1041hrs. AG2 was started at 1221hrs. | | | | | | | | | | | | | | | |
| Consequences: | | |  | | Risk Assessment: (People, Asset, Environment, Reputation) | | | | | | | | | | |
| No deferment / outage  Oil: 1.16kbbl  Gas: 20MMscf  Flare:  Other: Equipment integrity  Downtime: 7hrs | | |  | A | B | C | | D | | E | Actual: A1  Potential: A2D  Consequence Scenario  The Actual was rank A1 considering the impact on Asset and deferment. | | |
| 0 |  |  |  | |  | |  |
| 1 | A |  |  | |  | |  |
| 2 |  |  |  | |  | |  |
| 3 |  |  |  | |  | |  |
| 4 |  |  |  | |  | |  |
| 5 |  |  |  | |  | |  |
|  | | | | | | | | | | | | | | | |
| Immediate Corrective Actions Taken: | | | | | | | | | | | | | | | |
| # | Immediate action | | | | | | | | Date | | | | | By | Notification/WO # |
| 1 | Replace air inlet filter on G-8101 | | | | | | | | 18/04/2021 | | | | | Mechanical |  |
| 2 | Start-up G8101 | | | | | | | | 18./04/2021 | | | | | Electrical |  |
|  |  | | | | | | | |  | | | | |  |  |
|  |  | | | | | | | |  | | | | |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 2. WHAT DO WE THINK CAUSED THE PROBLEM? | | | | | | | |
| **Investigation Team** | | | **Team Composition:** | | | | |
| **Problem Statement (Primary Effect)** | | | Soku GP tripped on 18th April 2021 at 0415hrs.   1. Expected: Soku GP runs continuously until planned shutdown. 2. Actual:  Soku GP tripped on 18th April 2021 at 0415hrs 3. Impact: Production deferment and flare | | | | |
|  | | **Why? / Immediate cause** | | **Answer/Root Cause** | 3. EVIDENCE? | | |
| Why 1 | | Why did Soku GP trip? | | 1. Plant OSD1 was activated | 1. DCS alarm log | | |
| Why 2 | | Why was plant OSD1 activated? | | 1. Plant lost power supply 2. G-8101 was the duty gen 3. G-8111 was on standby 4. G-8121 was down on vent fan | 1. DCS alarm log and Machine UCP display. | | |
| Why 3 | | Why did plant lose power supply? | | 1. G-8101 duty gen tripped on HH Air Inlet Filter DP | 1. DCS alarm log and Machine UCP display. | | |
| Why 4 | | Why did G-8101 trip on HH Air inlet filter DP | | 1. Air inlet filter DP exceeded trip set point of 127mmH2O | Inlet filter DP trend (81PD321) shows DP rose to 157.9mmH2O above trip setpoint | | |
| Why 5 | | Why did Air inlet filter DP exceed trip set point? | | 1. Filter became clogged from accumulated dust. 2. G-8111 was on standby only for emergency use because it was almost due for core engine change out. 3. G-8121 was down. 4. Filter change out was deferred to a shutdown period 5. TAM was postponed. | 1. Atmosphere around Soku GP is often dusty; filter protects the turbine by trapping dust in the filter fibre. 2. Confirmed by 30k inspection 3. G-8121 confirmed down 4. Typical practice was to take advantage of shutdown windows to carry out such activities. 5. Soku GP TAM was originally planned for March 2021 but kicked off 19th April 2021. | | |
| Why 6 | | Why was the TAM postponed? | | 1. Production team aligned TAM with NLNG shutdown | 1. Confirmed by Soku TAM manager. | | |
| Soku GP tripped due to deferred replacement of G-8101 turbine air inlet filters | | | | | | | |
| 4. WHAT SOLUTIONS DO WE HAVE IN MIND? | | | | | | | |
| **#** | **Proposed Action** | | | | | **Action Party** | **Target Date** |
| 1 | Provide instruction to reassess risk from maintenance activities deferred to TAM when TAM is postponed. | | | | | MTL | 31/05/2021 |
| 2 | Restore G-8121 to ensure N+1 power availability | | | | | MTL | 31/07/2021 |
| 3 | Carry out engine change out for G-8111 to ensure N+1 power availability | | | | | MTL | 31/05/2022 |
| 4 | Escalate critical CM activity to site leadership and secure shutdown approval to execute task | | | | | MTL | 31/05/2021 |
| **5. HOW WILL THE PROPOSED SOLUTIONS ELIMINATE THE CAUSES OF THE PROBLEM?** | | | | | | | |
| 1. Reassessing the risk at TAM rescheduling on deferred maintenance activities will prevent escalation of an existing risk and minimise exposure. | | | | | | | |
| 1. Restoring G-8121 will ensure N+1 power availability | | | | | | | |
| 1. Carrying out engine change out for G-8111 will ensure N+1 power availability | | | | | | | |
| **LESSONS LEARNT**  Execute task that have potential for trips timely without deferring to a future date.  Changes in scheduled maintenance can impact on remotely connected activities. | | | | | | | |
| **Incident Owner: Anongo Sesugh** | | | | | | | |