



SMS na SAFRAN Helicopter Engines

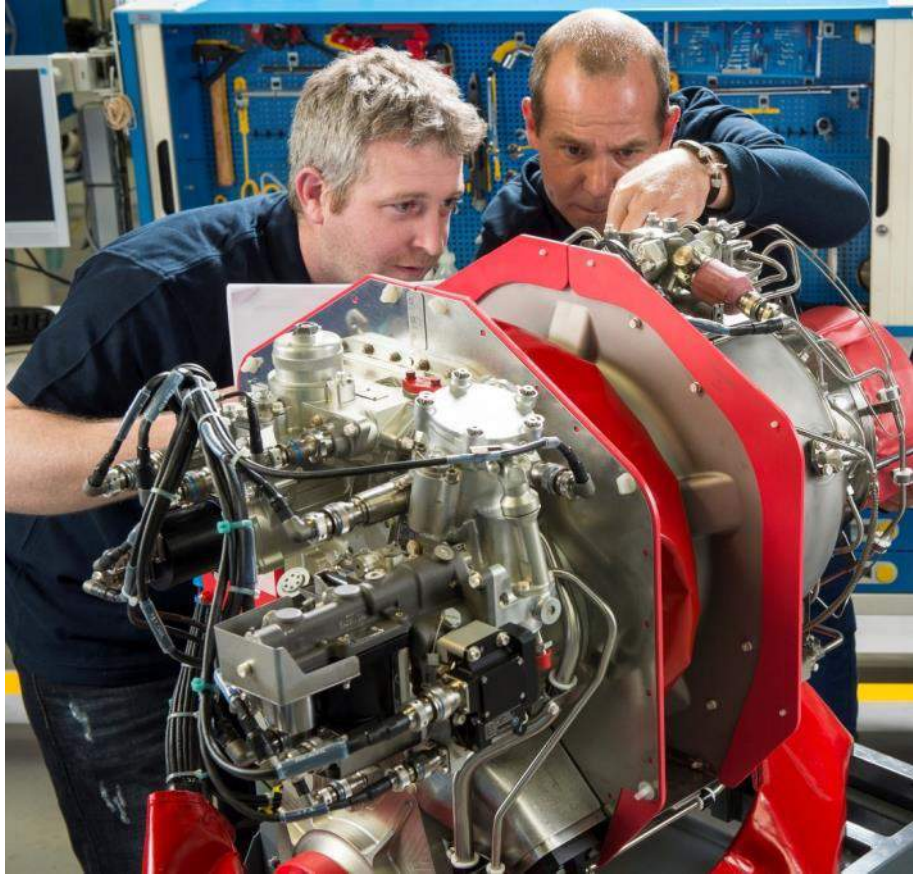
Metodologia de Análise de Eventos Técnicos

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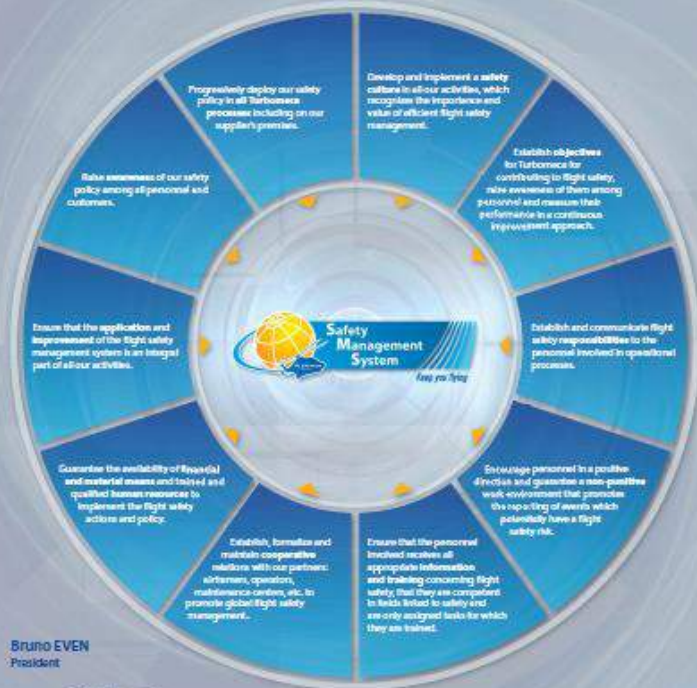
Política de Segurança na Safran Helicopter Engines



FLIGHT SAFETY POLICY

OUR COMMITMENTS

- > Our business: designing and manufacturing reliable and high performance helicopter turbines.
- > Our continuing primary goal: delivering safe products to our customers.



Bruno EVEN
President

SAFRAN
Turbomeca

- Nosso negócio: desenvolver e produzir motores de helicópteros **confiáveis** e de **alta performance**.
- Nosso objetivo primordial e contínuo: entregar **produtos seguros** aos nossos clientes.

SAFRAN
Turbomeca

SMS na Safran Helicopter Engines



- **Regulamentação francesa (DGAC)** requer a implementação de SMS nas organizações de manutenção Part 145.
 - MRO
 - Desde Janeiro 2012
 - Implementação em todos os sites

- **Safran HE decidiu ir além do escopo** definido pela regulamentação
 - Produção de itens novos:
 - Acessórios e Motores - Início em 2014
 - Partes Individuais - Início em 2015
 - Projeto/Design - Início em 2016



- **Safran HE possui 3 fatores chaves** para ter êxito na implementação do SMS
 - A rede Safran HE mantém 80% da frota (conseguimos capturar a maioria dos eventos ligados à segurança de voo),
 - A rede Safran HE utiliza um sistema de gerenciamento de qualidade único (Turbo+),
 - Compartilhamos os eventos relacionados à qualidade e à segurança de voo numa mesma base de dados.

SMS na Safran Helicopter Engines



- Principais fatores de riscos

Fatores Humanos ≈ 40%

Riscos gerenciados localmente

Ex: « Good Behaviour chart », « High Viz jacket » para reduzir distrações

Riscos gerenciados no nível corporativo

Ex: Implementação de padrões para reduzir FOD, choques, erros de montagem

Industrialização e Organização ≈ 50%

Riscos gerenciados localmente

Ex: 5S para reduzir riscos organizacionais

Riscos gerenciados em nível corporativo

Ex: Criação de referencial padrão único

Técnicas / Produtos ≈ 10%

Riscos gerenciados no nível corporativo

Ex: Implementação de Fatores Humanos no nível de Projeto (Design), melhoria contínua da documentação MRO

Análise de Riscos



- **Cobre** todas as atividades
- **Implementa** FMECA simplificado, dedicado às atividades de chão de fábrica
- **Melhora** a identificação e o tratamento de condições latentes
- **Organiza** revisões SMS locais (semanais) e em nível corporativo (trimestrais)

Promoção Interna



Política SMS

Política Não Punitiva

Treinamento Interno

Inovação SMS

Newsletters SMS

Posters Humorísticos

Promoção Externa



- Turbomeca Customer Symposium



- Bell safety symposium



- IHST symposium (BHEST)



- EASA rotorcraft symposium



- CHC Safety & Quality Summit



- Oil and Gas awards



- TOOLS



Treinamento SMS



- Para clientes
 - Duração: 2 dias
 - Principais objetivos / vantagens:
 - Obter conhecimento sobre Safety Management System (SMS)
 - Dominar a metodologia de análise SMS
 - Ter contato com a experiência Safran HE

- Para parceiros:
 - Duração: 1,5 dias
 - Principais objetivos / vantagens
 - Entender a participação da Safran HE em termos de segurança de voo
 - Estar capacitado para implementar SMS de acordo com os requisitos Safran HE
 - Compartilhar a experiência da Safran HE através de estudo de caso real

Inovação em Segurança



• 2014

INNOVATION SAFETY 2014 – 3^{ème} PRIX
CCIH – Triptyque

Développer une Culture Sécurité

INNOVATION SAFETY 2014 – 2nd PRIX
TSFIOA – CHARTRE BONNE CONDUITE EN ATELIER

Réduire les risques de DISTRACTION et INTERRUPTION de tâches

Managers, opérateurs, clients, fonctions supports, visiteurs etc... vous entrez dans un atelier sensible aux facteurs humains dans lequel le calme et la concentration sont essentiels. Merci de respecter la chartre de convivialité et d'efficacité de cet espace partagé.

- 1 Je me présente à l'encadrement si je suis extérieur au service
- 2 Je parle à voix modérée voire basse
- 3 J'évite les réunions autour de mon bureau ou de mon établi
- 4 Je n'interpelle pas mon collègue mais je vais le voir
- 5 Je demande
- 6 J'adopte un
- 7 Je m'informe
- 8 Je balaise la
- 9 Je mets moi

INNOVATION SAFETY 2014 – 1^{er} PRIZE
TMUK – High visibility vest

Wear a very colourful vest in the workshop during the realization of key tasks.

Target : reduce the risk of distraction and interruption of the task.

• 2015

Safran+ CONCOURS INNOVATION PARTICIPATIVE Innovation

Safety

FOD BANCs ESSAIS ACCESSOIRES SGS

Date dépôt: 12/06/2015 Ref: 00321

Auteurs: BERCOU, DELAUNAY, LORMAND, ORTHETRUZ, BALDIU, BEHERE, SARRAS, CAZAUX

Validation: PQUETGLAS

Innovation proposée:
Rangement en rails permettant la vidange des tuyauteries et un vuide de fluochromage.
Aspect SGS Plan FOD
Rangement plus pratique
Pas de charge lourde
Visuel sur les outillages
Cable de liaison.

Problème identifié / contexte de l'innovation:
Stockage des outillages d'essai en caisses lourdes.
Nettoyage régulier des
Ecart Audit pour risque
Rouillon qui tombe d'air

Safran+ CONCOURS INNOVATION PARTICIPATIVE Innovation

Safety

SUPPRESSION RISQUE FOD ETAU

Date dépôt: 10/09/2015 Ref: 00386

Auteurs: L'HER, LYSSARDY, GERT-SANTAMACH, FOURCAU, SEMAT

Validation: PQUETGLAS

Innovation proposée:
Suppression de la peinture par outillage
Traitement de fétus en phosphatation.

Problème identifié / contexte de l'innovation:
Echappé de la peinture des étau à l'essai de montage.
Risque de pollution accessoire FOD et SGS.
Ecart d'audit basique Qualité interne: par rapport au risque FOD.

Avant: **Après:**

Safran+ PARTICIPATIVE INNOVATION CONTEST Innovation

Safety

DIAL TEST INDICATOR PROBE COLOUR IDENTIFICATION

Date dépôt: 4 May 2015 Ref: 0006

Auteurs: Rubert Parry, Scott Gil, Luarn Simons, Piers Gutzmerick & Ryan Njama

Validation: TMA Innovation Committee

Proposed Innovation:
"Poke Yoke" Colour code for different length probes to their corresponding Dial Test Indicator. This is done with a part pen and putting a band on the probe and a dot on the body of the gauge of the same colour. Quick, cheap and easy.

Identified problem / Innovation context:
A lot of different types of Dial Test Indicators are used throughout the workshop, the quick way for the operator to identify the correct probe length. Chance that the probe could be changed to a different length. This would make the readings on the gauge incorrect, making a measurement within tolerance, when it's actually out of tolerance.

Innovation Impact:
Eliminate the risk of the incorrect length probe being put on the gauge. Then there wouldn't be any chance of incorrect measurements.
This will give the operator quick/easy identification of the correct gauge/probe length to use.

Before: **After:**

Notes:
Incorrect probe length causing gauge to read incorrectly. The capability to record measurements being recorded during the process. Parts/results could have measurements that don't fall in tolerance. Possible SMS tool.

Newsletters de Segurança



NEWSLETTER



N° 21 – APRIL 2014

MAJOR EVENT OF THE MONTH

- The European Africa Middle-East (EAME) symposium 2014 took place in Biarritz. We participated to a round table in plenary dedicated to safety where Mr Tony Randall (Manager, Continued Operational safety) from Bell, Mr Patrick Fauchere (Flight Operations Manager) from Air Glaciers, and Turbomeca attended. During this symposium, we also animated 5 SMS workshops with the cooperation of Air Glaciers. A strong participation rate (66 on 180) and a high degree of interest of the participants for the safety improvement have been noted.
- Besides, the 10th CHC Safety and Quality Summit took place at the same time in Vancouver. The main theme was about how to transform the theory into best practices, by taken into account the reality on the ground, the human factors, and the change. The number of participants was around 800 and the number of workshops increased from 48 to 60.
- We have performed the 3rd SMS training dedicated to Asia area operators customers (Thailand, Indonesia, Malaysia, and Singapore) in Singapore (12 customers).

SMS DEPLOYMENT

- On March 20th, 2014:
 - We have registered a total of 101 SMS PDCA issued since January 2013. The total of SMS PDCA closed is 47. The average processing time is 140 days and the on-going average age is 186 days.
 - The closing rate of the SMS PDCA within 60 days is 33% for an objective of 70%. Only the SMS PDCA issued since January 2014 are taken into account for this indicator.
- The 5th SMS poster about the events reporting has been distributed in MRO sector and is on-going to be distributed to the new production. It is available on TOOLS and intranet. The aim of this poster is to remain the importance to notify the potential SMS events and that Turbomeca provides to its personnel necessary means to report them.



INTERNAL COMMUNICATION



NEWSLETTER



N° 31 – APRIL 2015

MAJOR EVENT OF THE MONTH

- In the continuity of SAFRAN inter-group best practices sharing for the reduction of SMS risks, we welcomed a SAGEM team in Bordes site. The visit of workshops allowed them to visualize the initiatives led in CCiC within the framework of the SMS deployment.
- We received Ari Vatanen in the Bordes site, not only as a former automobile rally pilot but especially as a helicopter pilot. During the workshop visit, many exchanges took place between the personnel of assembly shop and the CCiC. Ari Vatanen showed his strong interest in our activity and questioned assemblers many times in order to know which measures were put in place to limit human factors influence on flight safety.



SMS DEPLOYMENT

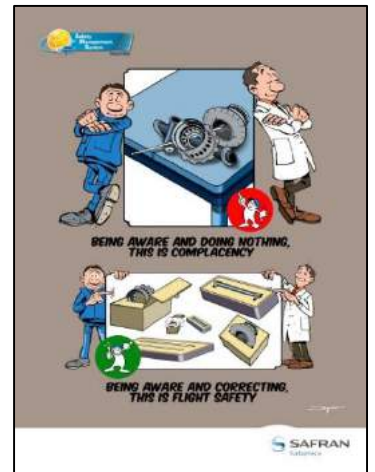
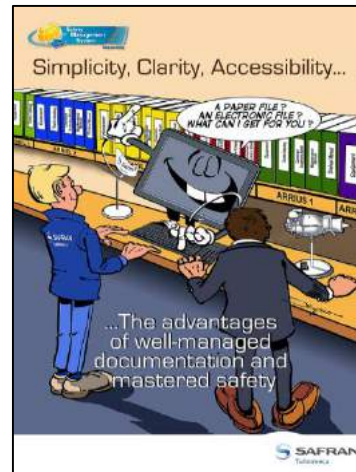
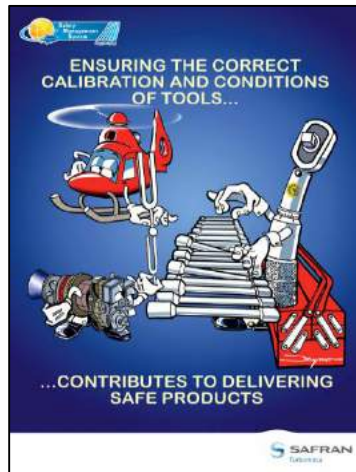
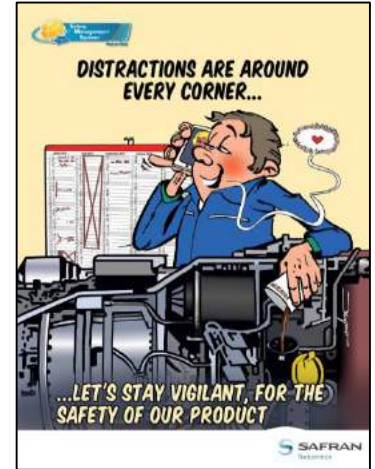
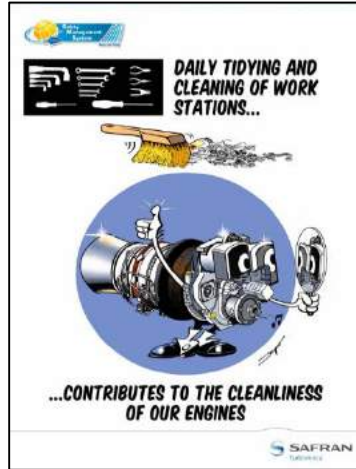
- The outstanding number of SMS PDCA on the 24th of April 2015 is 70 (33 for sites and 37 for Corporate). The closure rate at 90 days is 45% for an objective at 60%.
- The first bi-annual SMS webex took place on the 16th of April 2015. It was the opportunity to exchange on the SMS results obtained on the first quarter:
 - The PDCA performance and quality of treatment
 - Action plans to limit identified risks for each site
 - The use of the SMS Excellence matrice (actual level from 1 to 4)
 - Progress plans to reach level 3 of Excellence
- The 9th SMS poster based on the theme of complacency was distributed and is available on TOOLS website, Insite and Sharepoint networks.



INTERNAL COMMUNICATION



Posters Humorísticos sobre SMS



Nossos Desafios



2

Metodologia de Análise de Eventos Técnicos























































A maior variedade de motores de helicópteros



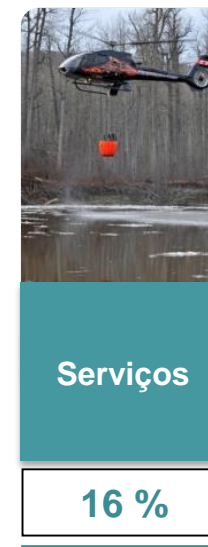
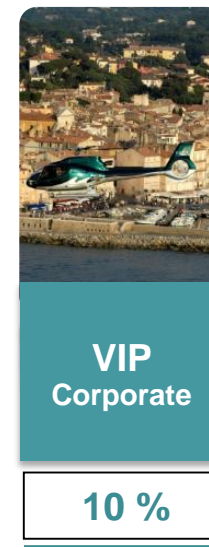
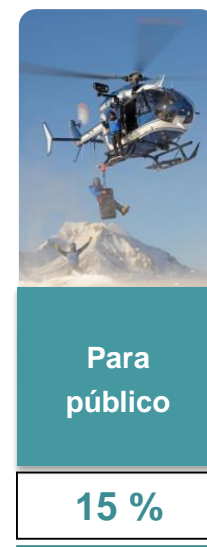
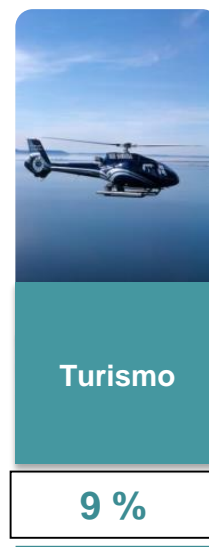
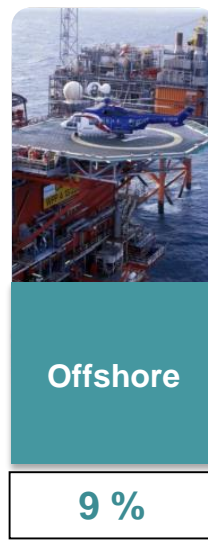
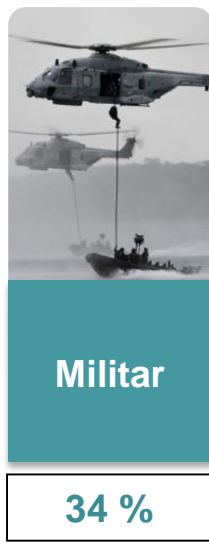
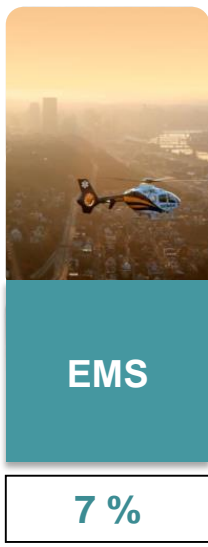
ARRIUS	ARRIEL	ARRANO	MTR390	ARDIDEN	MAKILA	RTM322	ANETO
<p>450-750 shp 1.5 to 3.5 tons</p>	<p>650-1,000 shp 2 to 5 tons</p>	<p>1,100-1,300 shp 4 to 6 tons</p>	<p>1,250-1,450 shp 6 to 7 tons</p>	<p>1,400-2,000 shp 5 to 8 tons</p>	<p>1,800-2,100 shp 9 to 12 tons</p>	<p>2,100-2,600 shp 9 to 14 tons</p>	<p>3,000+ shp 8 to 15 tons</p>

A maior variedade de motores de helicópteros

 BELL 505 1 Arrius 2R	 H125 1 Arriel 2D	 H160 2 Arrano 1A	 TIGRE HAP/UHT/ARH 2 MTR 390 2C	 DHRUV 2 Ardiden 1H1/Shakti	 H215 2 Makila 1A1	 NH90 2 RTM322 01/9	 AW189K 2 ANETO-1K
 H135 2 Arrius 2B2 ^{plus}	 H130 1 Arriel 2D		 TIGRE HAD 2 MTR 390 E	 LCH 2 Ardiden 1H1/Shakti	 H225 2 Makila 2A1	 AW101 MERLIN 3 RTM322 02/8	
 H120 1 Arrius 2F	 H145 2 Arriel 2E			 KA-62 2 Ardiden 3G	 H225M 2 Makila 2A	 AH MK.1 APACHE 2 RTM322 01/12	
 KA-226T 2 Arrius 2G1	 UH-72A 2 Arriel 1E2			 AG352 2 Ardiden 3C/WZ16			
	 H155 2 Arriel 2C2			 LUH 1 Ardiden 1U			
	 AS565 MBE 2 Arriel 2N						
	 S-76C++ 2 Arriel 2S2						
	 LAH 2 Arriel 2L2						
	 H425 2 Arriel 2C						
							
ARRIUS  450-750 shp  1.5 to 3.5 tons	ARRIEL  650-1,000 shp  2 to 5 tons	ARRANO  1,100-1,300 shp  4 to 6 tons	MTR390  1,250-1,450 shp  6 to 7 tons	ARDIDEN  1,400-2,000 shp  5 to 8 tons	MAKILA  1,800-2,100 shp  9 to 12 tons	RTM322  2,100-2,600 shp  9 to 14 tons	ANETO  3,000+ shp  8 to 15 tons

THE WIDEST RANGE OF HELICOPTER ENGINES

2.500 clientes em 155 países



80 % dos nossos clientes operam menos de 5 helicópteros

Atividade Mundial – Presença Local



Proximidade dos 2500 clientes: 13 sites fora da França.

Presença no Brasil



**Bancos de Provas,
Centro de Manutenção, Centro de Reparos,
Montagem de Motores Novos, Field Reps, Service Engineers.**

Gerenciamento de Eventos Técnicos



IDENTIFICAÇÃO



EVENTO / REGISTRO DE CONSULTA

Sistema TI + Base de Dados (NOMAD)

**REGISTRO/
TRATAMENTO**



ANÁLISE

Engenharia de Serviços/ Especialistas Safran HE



FORMALIZAÇÃO (E-mail, carta, relatório de investigação, concessão técnica, etc)

REGISTRO DA RESPOSTA (Rastreabilidade)

ENVIO DA RESPOSTA

COMUNICAÇÃO
(Cliente)

Gerenciamento de Eventos Técnicos

◆ Coleta dos eventos técnicos (Operadores, Oficinas, Field Reps).

> O Primeiro filtro é realizado de acordo com a General Service Letter 2173/02.

> O evento técnico é um potencial incidente/acidente (RI/RA)?

SIM

Registro do evento como « In-Service Event » na base de dados do NOMAD

Validação dos Incidentes/ Acidentes pelos Investigadores (delegação do Departamento de Aeronavegabilidade)

Análise de Risco

NÃO

O evento levou a uma remoção (motor ou equipamento)? Foi um evento relevante?

SIM

Registro do evento na base de dados NOMAD (rastreabilidade)

NÃO

Assistência ao Cliente

Gerenciamento de Eventos Técnicos - Indicadores

RELATÓRIO DE ACIDENTES (RA)



ACIDENTES

RELATORIO DE INCIDENTES (RI)



INCIDENTES

CIREN



POTENCIAIS EVENTOS DE
AERONAVEGABILIDADE
DETECTADOS

ANÁLISE DE CAUSA RAIZ



DESVIOS



Gerenciamento de Eventos Técnicos - Indicadores



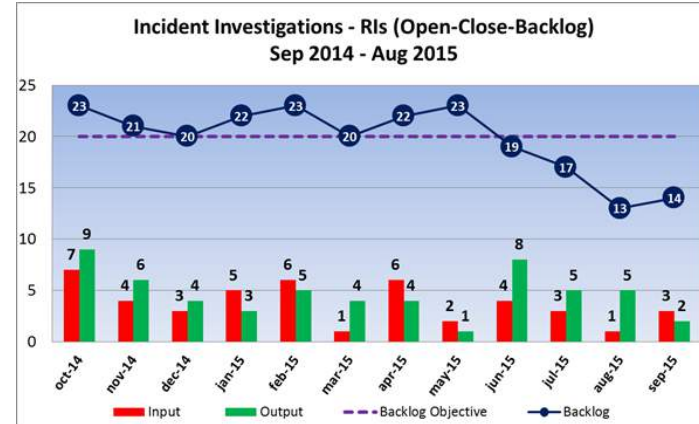
FEEDBACK ON EVENTS:

TIME : 8.30 am to 9.00 am Line TURBO+ meetings Release inspection

Item	Priority	Status	Responsible	Due Date
1	High	Open	J. Durand	15/10/14
2	Medium	In Progress	M. Lefevre	20/10/14
3	Low	Resolved	A. Moreau	10/10/14
4	High	Open	P. Petit	25/10/14
5	Medium	In Progress	S. Rousseau	30/10/14
6	Low	Resolved	D. Thomas	05/10/14
7	High	Open	F. Dubois	15/11/14
8	Medium	In Progress	G. Martin	20/11/14
9	Low	Resolved	H. Bernard	10/11/14
10	High	Open	I. Girard	25/11/14
11	Medium	In Progress	L. Bonnet	30/11/14
12	Low	Resolved	K. Meyer	15/11/14
13	High	Open	N. Dubois	20/12/14
14	Medium	In Progress	O. Petit	25/12/14
15	Low	Resolved	P. Moreau	10/12/14
16	High	Open	Q. Lefevre	20/01/15
17	Medium	In Progress	R. Durand	25/01/15
18	Low	Resolved	S. Girard	10/01/15
19	High	Open	T. Bonnet	20/02/15
20	Medium	In Progress	U. Meyer	25/02/15
21	Low	Resolved	V. Dubois	10/02/15
22	High	Open	W. Petit	20/03/15
23	Medium	In Progress	X. Moreau	25/03/15
24	Low	Resolved	Y. Lefevre	10/03/15
25	High	Open	Z. Durand	20/04/15
26	Medium	In Progress	AA. Girard	25/04/15
27	Low	Resolved	BB. Bonnet	10/04/15
28	High	Open	CC. Meyer	20/05/15
29	Medium	In Progress	DD. Dubois	25/05/15
30	Low	Resolved	EE. Petit	10/05/15
31	High	Open	FF. Moreau	20/06/15
32	Medium	In Progress	GG. Lefevre	25/06/15
33	Low	Resolved	HH. Durand	10/06/15
34	High	Open	II. Girard	20/07/15
35	Medium	In Progress	JJ. Bonnet	25/07/15
36	Low	Resolved	KK. Meyer	10/07/15
37	High	Open	LL. Dubois	20/08/15
38	Medium	In Progress	MM. Petit	25/08/15
39	Low	Resolved	NN. Moreau	10/08/15
40	High	Open	OO. Lefevre	20/09/15
41	Medium	In Progress	PP. Durand	25/09/15
42	Low	Resolved	QQ. Girard	10/09/15

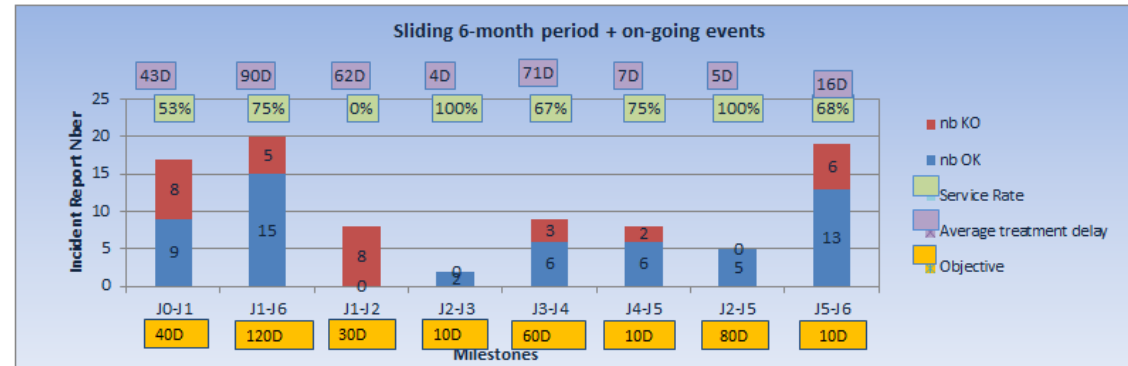


ONE OF THE PILLARS OF THE SMS



Performance by milestone

TMB - Mechanical+System



Feedback sobre eventos (Reliability Dashboards)

CLIENTES SBH/GSP – MONITORAMENTO PERSONALIZADO DA CONFIABILIDADE - DASHBOARD

ROTINA:

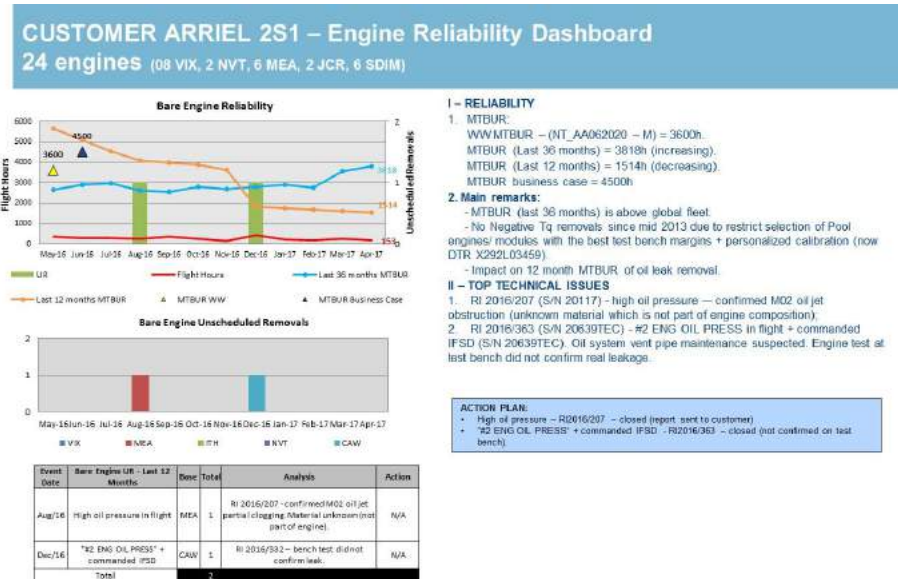
- ✓ MONITORAMENTO MENSAL:
 - ✓ Remoções não programadas,
 - ✓ **Horas de Voo**,
- ✓ Calculos do MTBURs (Motor, HMU, DECU).
- ✓ Análise dos eventos técnicos.
- ✓ Reuniões mensais para acompanhamento do plano de ação.

OBJETIVO:


- ✓ Estabelecer um plano de ação e monitorá-lo com objetivo de reduzir as remoções não programadas.

RESULTADOS ESPERADOS:


- ✓ Aumento do MTBUR.
- ✓ Aumento da disponibilidade da frota.




OBRIGADO!



Safety Management System



Safety in the air
starts from...



Safety on the ground

