

An integrated technology platform to standardize and facilitate the FEL process definition, execution and validation, Phase1

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Title: Geophysics

Company: PEMEX



What's Next?

SIS Global Forum 2017

September 13-15

Le Palais des Congrès de Paris

Schlumberger

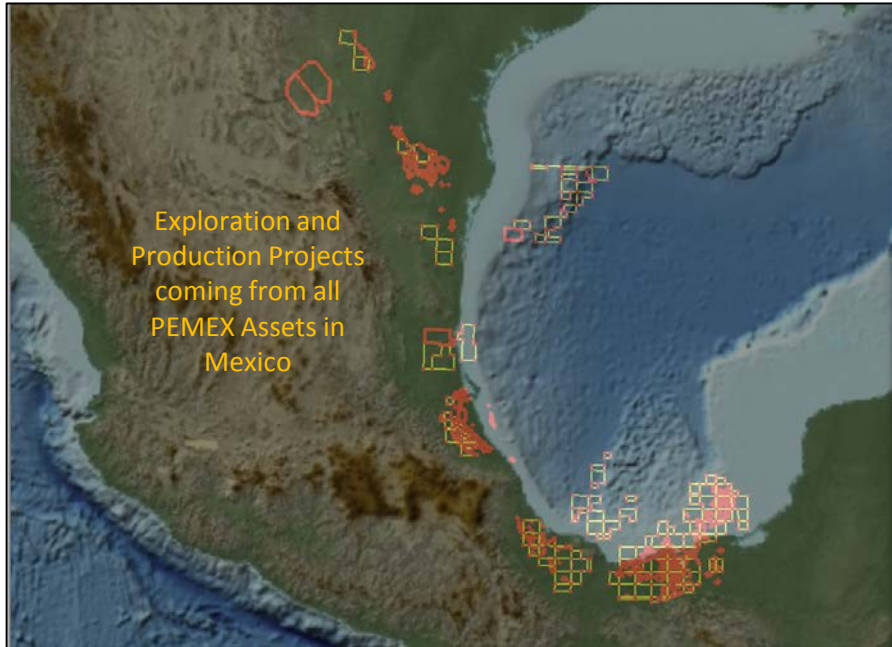
Agenda

- Introduction
- Objectives
- Solution
- Results
- Benefits
- Conclusions
- Next steps



Introduction

Exploration and extraction assignments



Attribute spreadsheet for Asignaciones_Extraccion

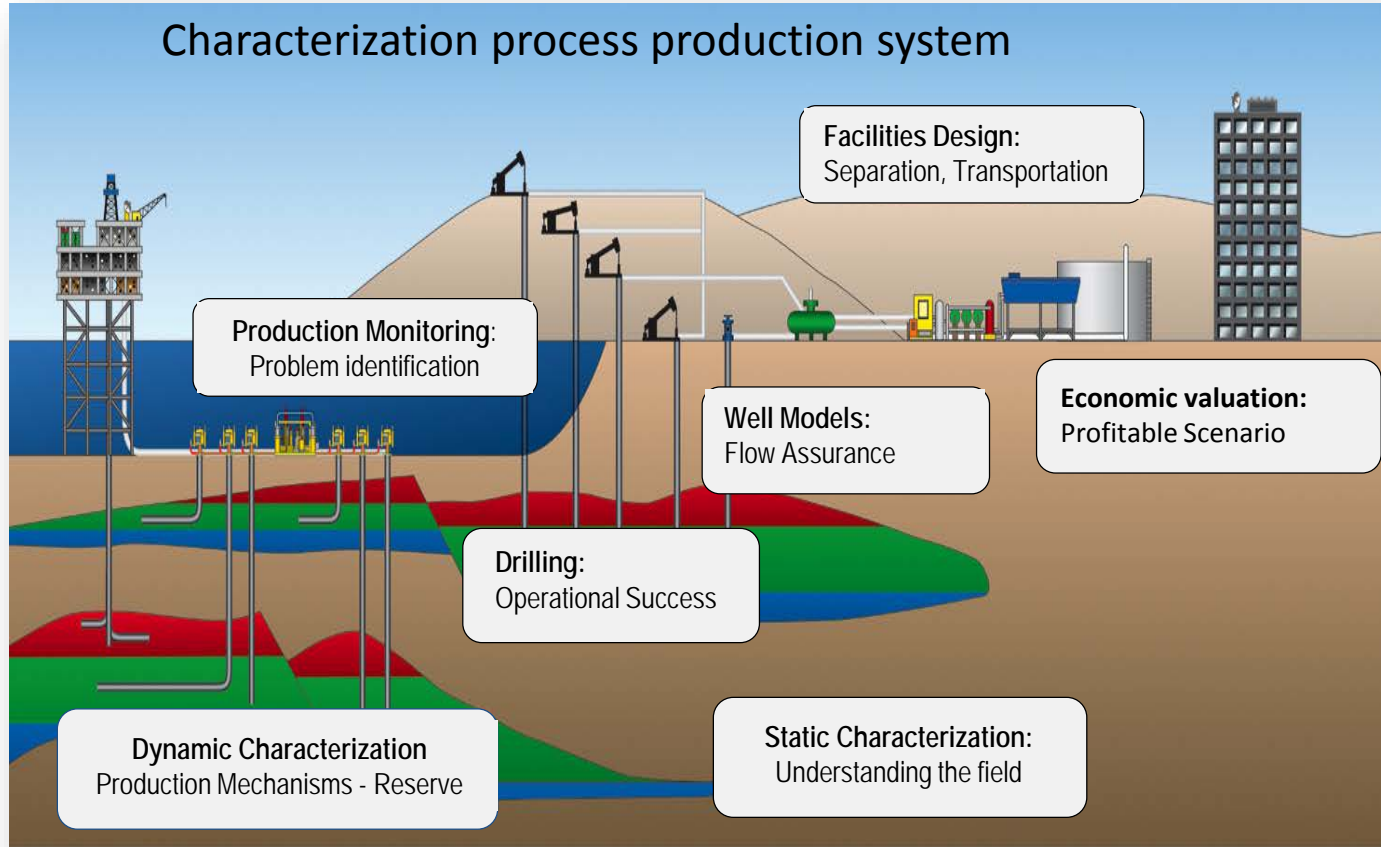
	OBJECTID	Asignacion	Id	REGION
269	208.00	A-0208-M - Campo Mata Pionche	02	Región Norte
270	212.00	A-0400 - Olmos	04	Región Norte
271	172.00	A-0342-M - Campo Tokal	03	Región Sur
272	62.00	A-0218-M - Campo Miralejos	02	Región Norte
273	64.00	A-0371-M - Campo Xux	03	Región Marina Suroeste
274	66.00	A-0040-M - Campo Barajas	00	Región Norte
275	84.00	A-0322-M - Campo Takín	03	Región Marina Noreste
276	87.00	A-0188-M - Campo Lakach	01	Región Marina Suroeste
277	27.00	A-0227-M - Campo Morallillo	02	Región Norte
278	28.00	A-0228-M - Campo Mozutla	02	Región Norte
279	174.00	A-0367-M - Campo Vistoso	03	Región Norte
280	175.00	A-0369-M - Campo Xanab	03	Región Marina Suroeste
281	176.00	A-0073-M - Campo Cehualaca	00	Región Norte
282	335.00	A-0193-M - Campo Lizamba	01	Región Norte
283	378.00	A-0233-M - Campo Navegante	02	Región Sur

283 Production assignments

Attribute spreadsheet for Asignaciones_Exploracion

	OBJECT	Asignacion	Id	REGION	NA
111	66.00	AE-0090-M - Cinturón Subsalino - 06	00	Región Norte	AE-
112	12.00	AE-0015-M - Pilar de Akal-Kayab - 01	00	Región Marina Noreste	AE-
113	105.00	AE-0022-2M - Okom - 05	00	Región Marina Suroeste	AE-
114	59.00	AE-0082-M - Cinturón Plegado Perdi	00	Región Norte	AE-
115	17.00	AE-0020-M - Okom - 03	00	Región Marina Suroeste/Región Marina Nor	AE-
116	61.00	AE-0085-M - Cinturón Subsalino - 01	00	Región Norte	AE-
117	74.00	AE-0098-M - Nox-Hux - 02	00	Región Marina Suroeste/Región Marina Nor	AE-
118	8.00	AE-0011-M - Pilar de Akal-Kayab - 01	00	Región Marina Noreste	AE-
119	103.00	AE-0008-2M - Amoca-Yaxche - 06	00	Región Marina Suroeste	AE-
120	102.00	AE-0006-2M - Amoca-Yaxche - 04	00	Región Marina Suroeste	AE-
121	1.00	AE-0001-M - Xcaanda - 01	00	Región Marina Suroeste	AE-
122	42.00	AE-0054-M - Mezcaltapa - 04	00	Región Sur	AE-
123	33.00	AE-0039-M - Tesechoacán - 01	00	Región Norte	AE-
124	32.00	AE-0038-M - Joachín - 08	00	Región Norte	AE-
125	114.00	AE-0084-2M - Agua Dulce - 03	00	Región Sur	AE-

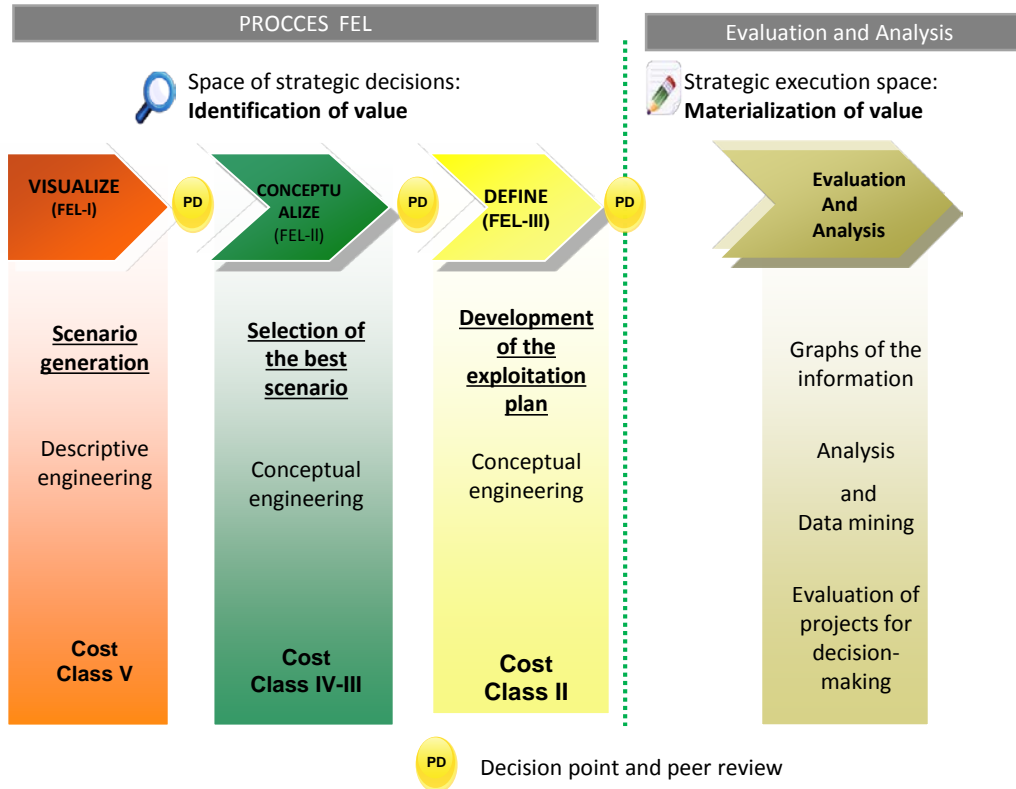
125 Exploration assignments



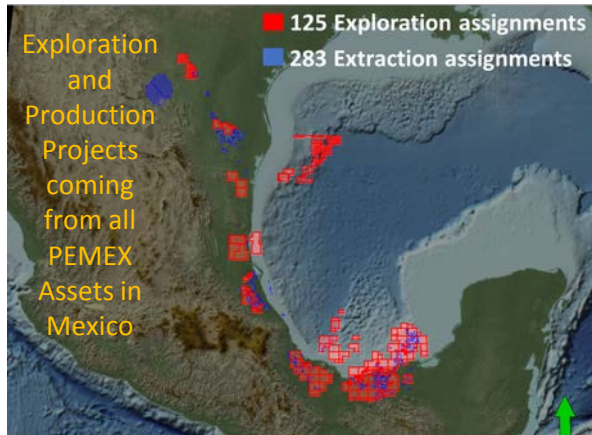
Introduction

System design based on the FEL methodology

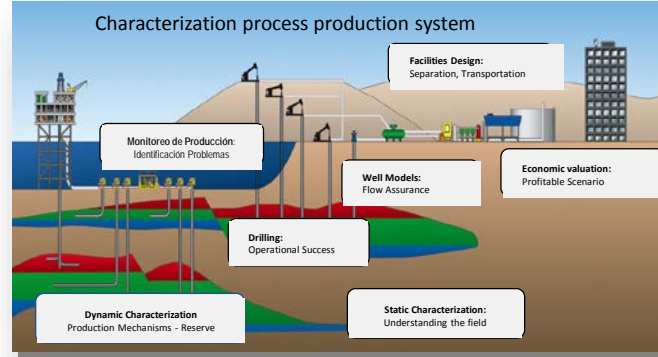
Planning, design and execution of projects, focused on achieving business objectives, minimizing costs and time, to close the gap between planned and real, keeping the expected scope.



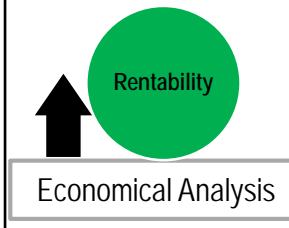
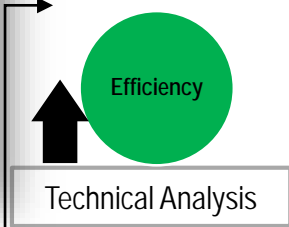
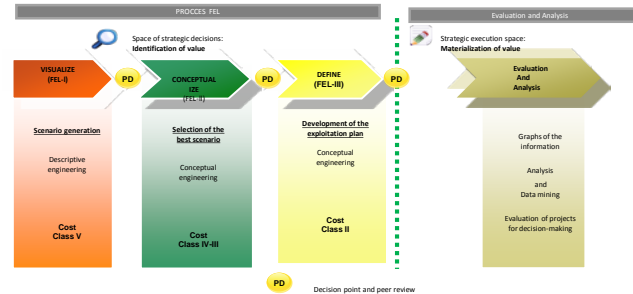
Introduction



Problem analysis



System design based on the FEL methodology



Objective

The principal objective of building this technology platform is to create a system for revision of information, quality control of engineering studies and documentation of the results of the projects in an efficient, standard and direct manner. In developing this technology platform, several software components have been utilized and developed as below: **Petrel platform, Guru, studio, Petrel-Plugin, WEB-Page and Database**



Objective

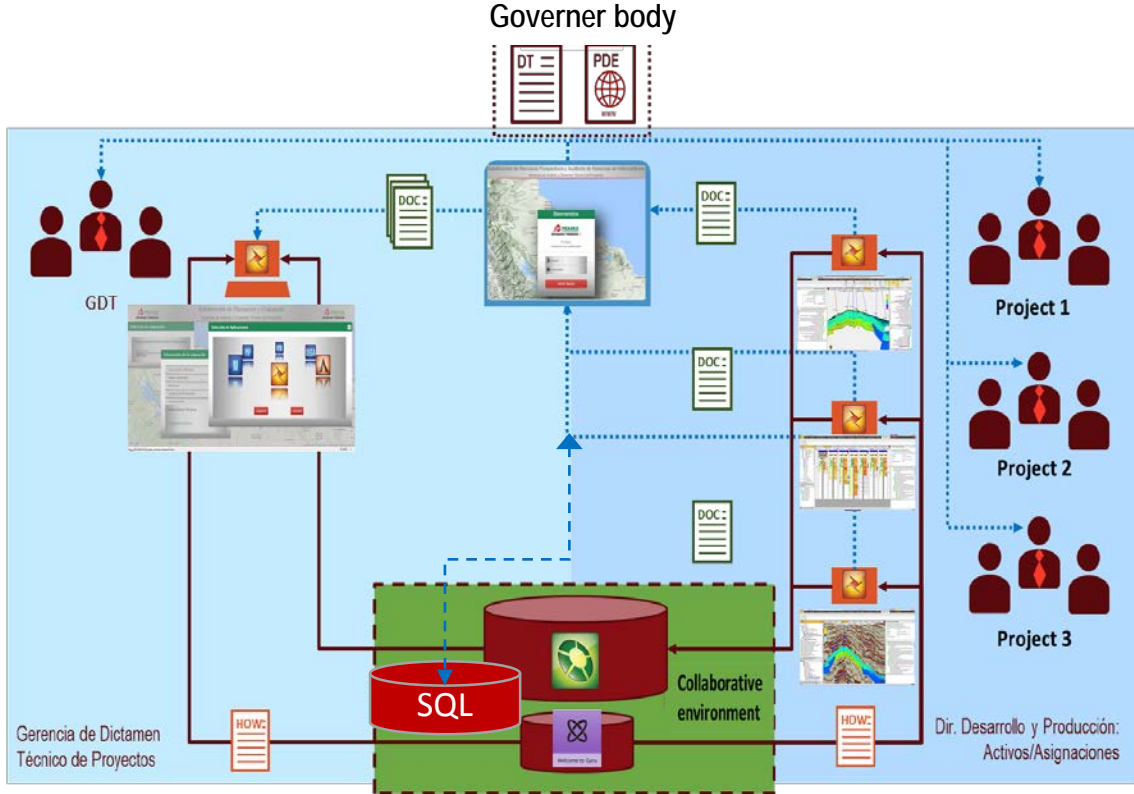
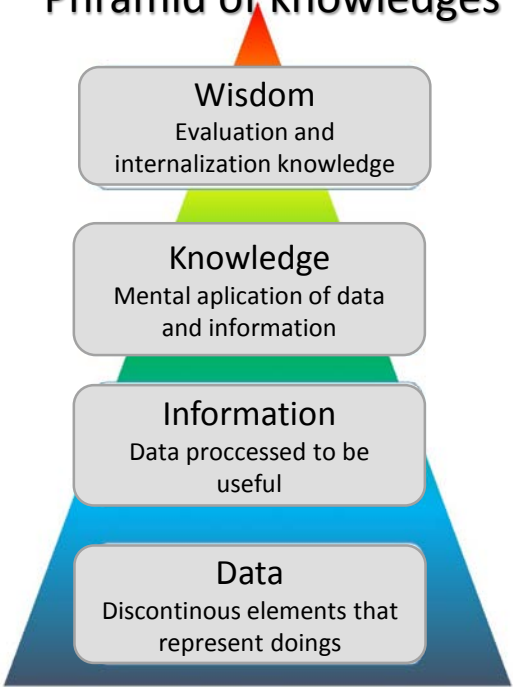
Pemex needs to systematize the dictamen procedure based on FEL method in order to:

- Promote collaboration and integration across disciplines
- Have a safe data and knowledge repository with controlled access
- Traceable information, easy to be consumed
- Standard way of work and delivering projects across all the PEMEX assets in Mexico
- Support PEMEX Digital Transformation and data science future initiatives



Solution

Phramid of knowledges



Gerencia de Dictamen Técnico de Proyectos

Dir. Desarrollo y Producción: Activos/Asignaciones

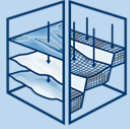
Solution

Phase I

Phase II

Phase III

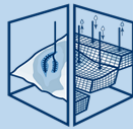
Guides / Documentation



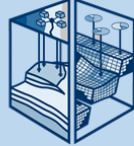
Geology & Modeling



Geophysics



Reservoir Engineering



Production



Economics & Planning



Drilling



Diffusion/
Implementation

Technological solution



"Web Platform"
DOCUMENTATION (DSD)



Plug-in
Documentation



"Web Platform"
SEARCHS
REVIEW / COMMENTS



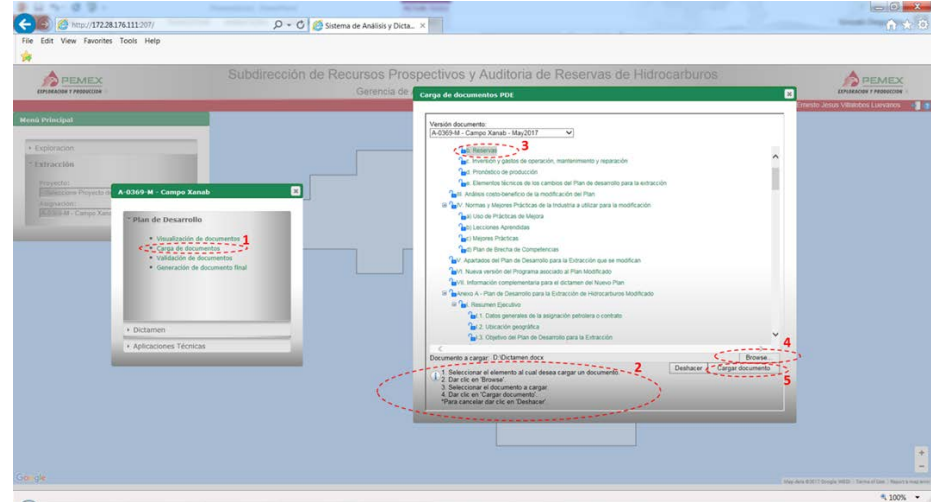
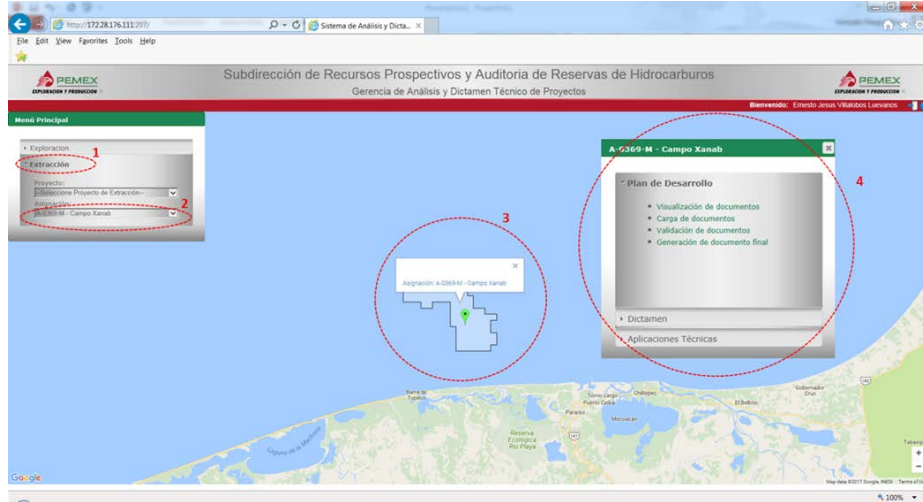
Administration
Tool



Plug-in
Technical Review
& Advisory

Solution

The **webpage** is available for visualization purpose and mostly for management. All the deliverables, reports, projects are visible from the webpage that has been developed



Solution

Documents were generated through **Guru Platform**

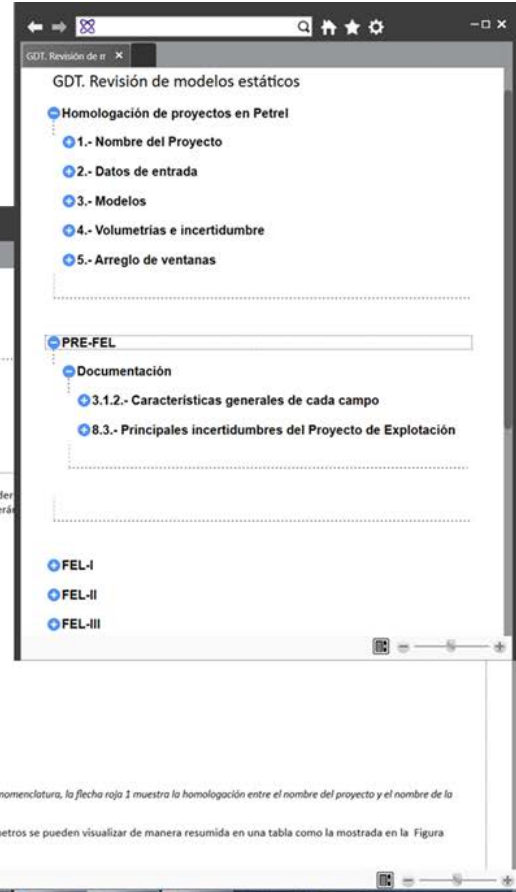
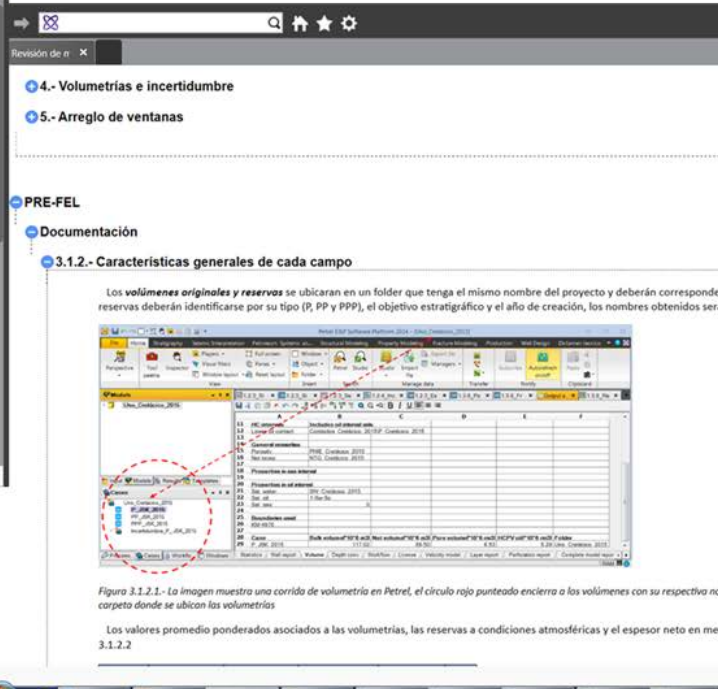
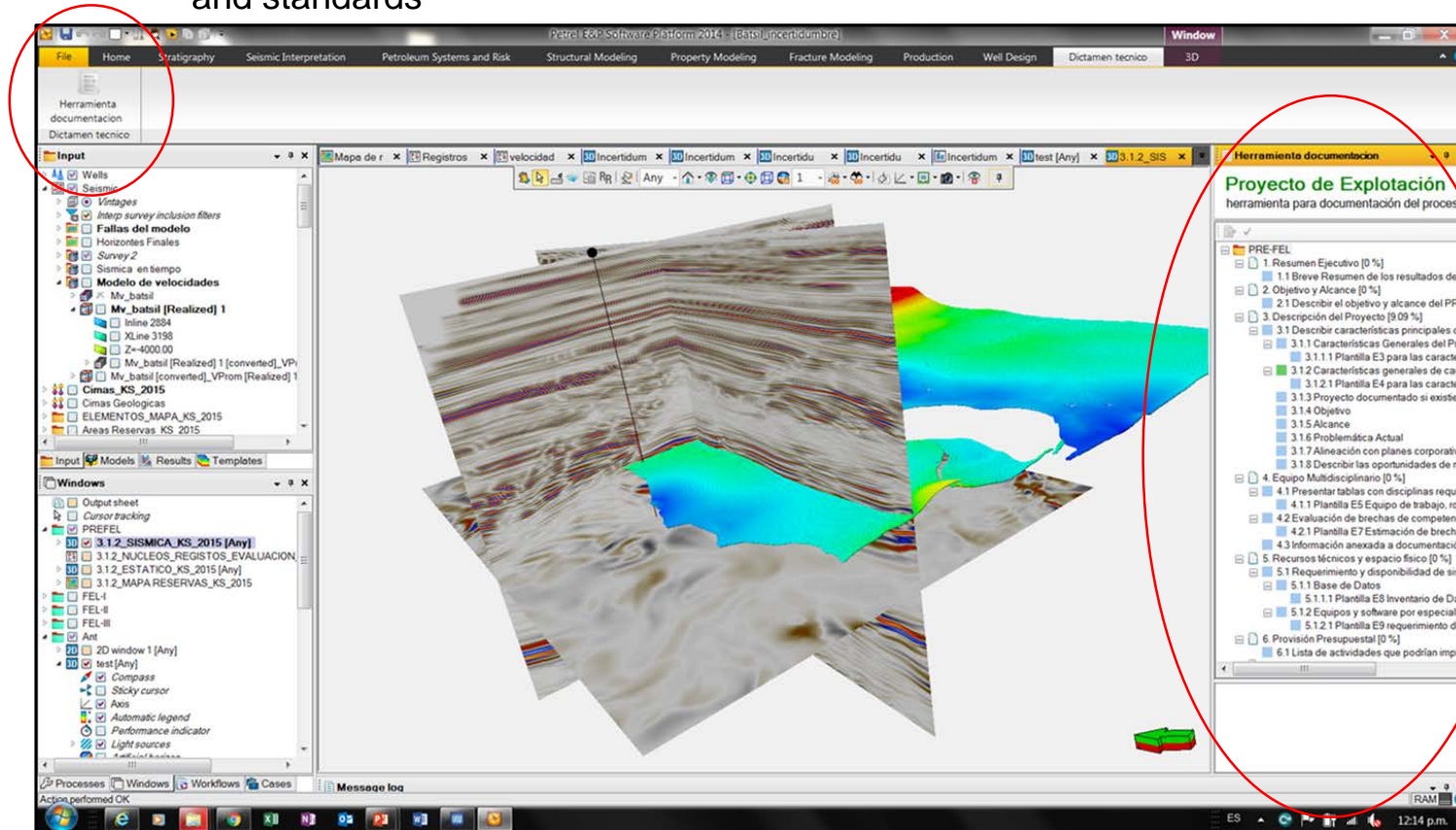


Figura 3.1.2.1.- La imagen muestra una corrida de volumetría en Petrel, el círculo rojo punteado encierra a los volúmenes con su respectiva nomenclatura, la flecha roja 1 muestra la homologación entre el nombre del proyecto y el nombre de la carpeta donde se ubican las volumetrías

Los valores promedio ponderados asociados a las volumetrías, las reservas a condiciones atmosféricas y el espesor neto en metros se pueden visualizar de manera resumida en una tabla como la mostrada en la Figura 3.1.2.2

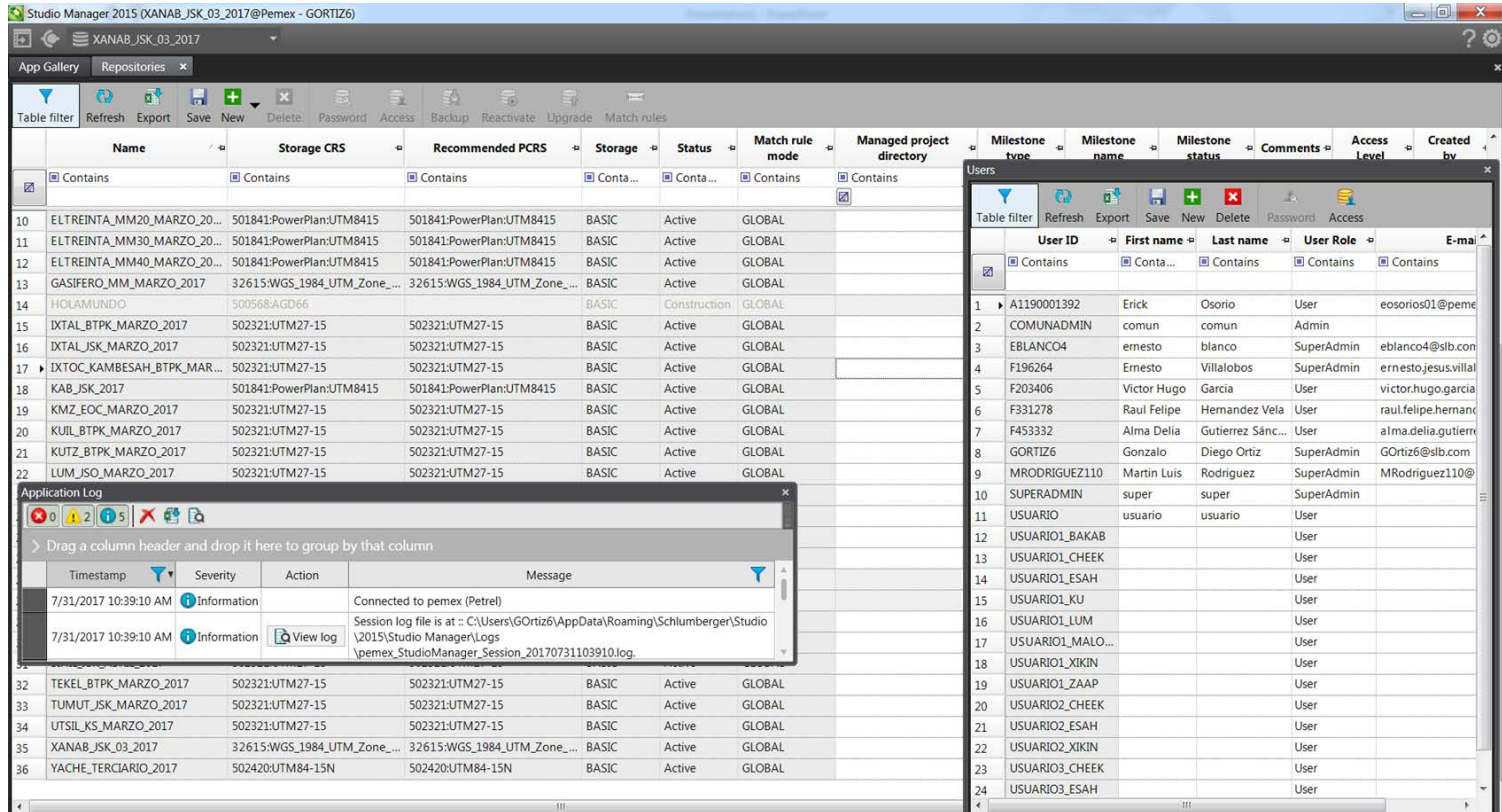
Solution

The **plug-in** in Petrel helps for the reporting part of the studies to follow certain templates and standards



Solution

Petrel **Studio** creates a collaborative environment for communication between different parties involved in the FEL project



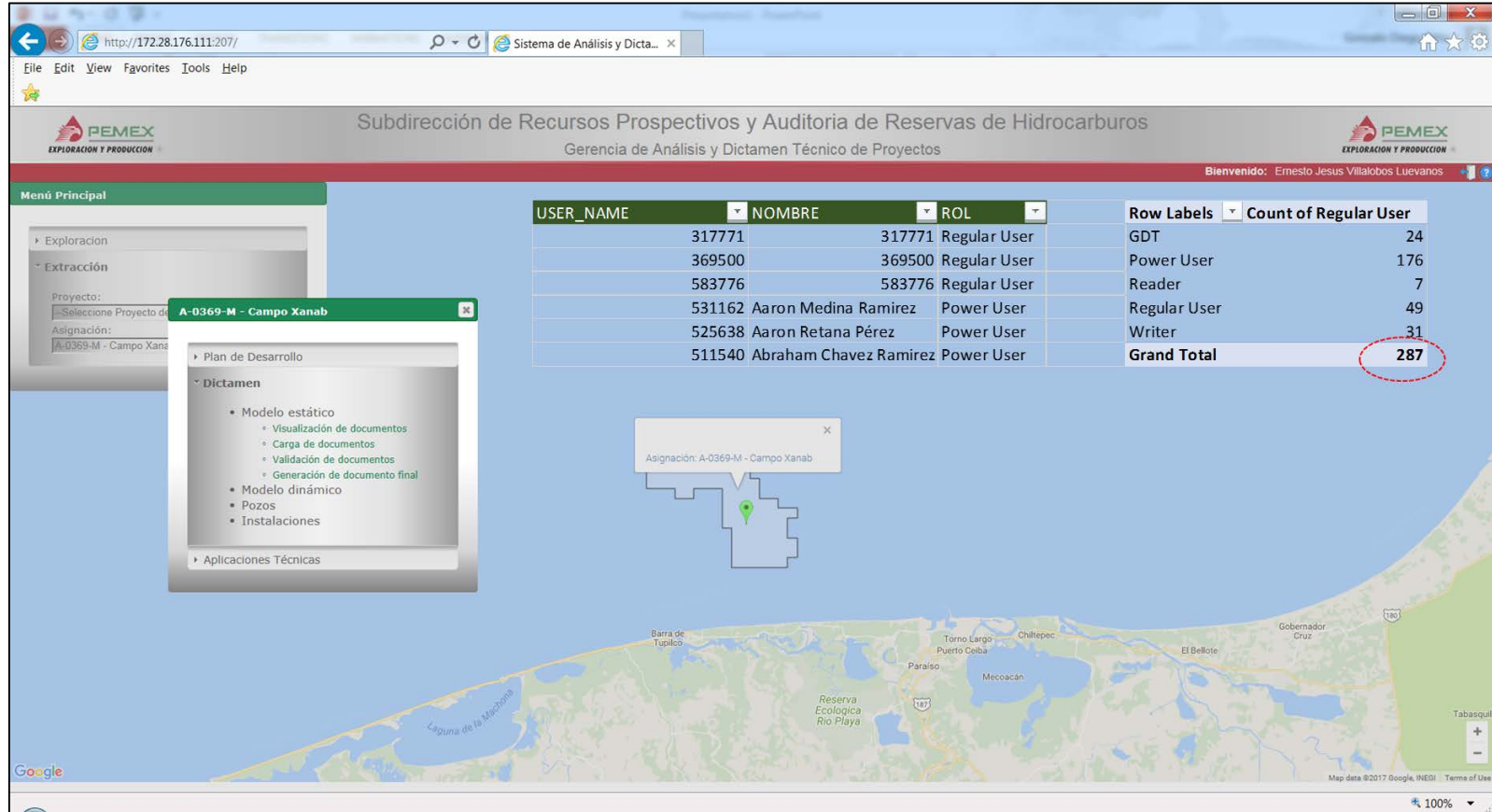
The screenshot displays the Studio Manager 2015 interface. The main window shows a table with columns: Name, Storage CRS, Recommended PCRS, Storage, Status, Match rule mode, Managed project directory, Milestone type, Milestone name, Milestone status, Comments, Access Level, and Created by. An 'Application Log' window is open, showing a message: 'Connected to pemex (Petrel)'. A 'Users' window is also open, displaying a list of users with columns: User ID, First name, Last name, User Role, and E-mail.

Name	Storage CRS	Recommended PCRS	Storage	Status	Match rule mode	Managed project directory	Milestone type	Milestone name	Milestone status	Comments	Access Level	Created by
10	EL TREINTA_MM20_MARZO_20...	501841:PowerPlan:UTM8415	501841:PowerPlan:UTM8415	BASIC	Active	GLOBAL						
11	EL TREINTA_MM30_MARZO_20...	501841:PowerPlan:UTM8415	501841:PowerPlan:UTM8415	BASIC	Active	GLOBAL						
12	EL TREINTA_MM40_MARZO_20...	501841:PowerPlan:UTM8415	501841:PowerPlan:UTM8415	BASIC	Active	GLOBAL						
13	GASIFERO_MM_MARZO_2017	32615:WGS_1984_UTM_Zone...	32615:WGS_1984_UTM_Zone...	BASIC	Active	GLOBAL						
14	HCLAMUNDO	500568:AGD66		BASIC	Construction	GLOBAL						
15	IXTAL_BTPK_MARZO_2017	502321:UTM27-15	502321:UTM27-15	BASIC	Active	GLOBAL						
16	IXTAL_JSK_MARZO_2017	502321:UTM27-15	502321:UTM27-15	BASIC	Active	GLOBAL						
17	IXTOC_KAMBESAH_BTPK_MAR...	502321:UTM27-15	502321:UTM27-15	BASIC	Active	GLOBAL						
18	KAB_JSK_2017	501841:PowerPlan:UTM8415	501841:PowerPlan:UTM8415	BASIC	Active	GLOBAL						
19	KMZ_EOC_MARZO_2017	502321:UTM27-15	502321:UTM27-15	BASIC	Active	GLOBAL						
20	KUIL_BTPK_MARZO_2017	502321:UTM27-15	502321:UTM27-15	BASIC	Active	GLOBAL						
21	KUTZ_BTPK_MARZO_2017	502321:UTM27-15	502321:UTM27-15	BASIC	Active	GLOBAL						
22	LUM_JSO_MARZO_2017	502321:UTM27-15	502321:UTM27-15	BASIC	Active	GLOBAL						
32	TEKEL_BTPK_MARZO_2017	502321:UTM27-15	502321:UTM27-15	BASIC	Active	GLOBAL						
33	TUMUT_JSK_MARZO_2017	502321:UTM27-15	502321:UTM27-15	BASIC	Active	GLOBAL						
34	UTSIL_KS_MARZO_2017	502321:UTM27-15	502321:UTM27-15	BASIC	Active	GLOBAL						
35	XANAB_JSK_03_2017	32615:WGS_1984_UTM_Zone...	32615:WGS_1984_UTM_Zone...	BASIC	Active	GLOBAL						
36	YACHE_TERCARIO_2017	502420:UTM84-15N	502420:UTM84-15N	BASIC	Active	GLOBAL						

User ID	First name	Last name	User Role	E-mail
1	A1190001392	Erick Osorio	User	eosorios01@peme
2	COMUNADMIN	comun comun	Admin	
3	EBLANCO4	ernesto blanco	SuperAdmin	eblanco4@slb.com
4	F196264	Ernesto Villalobos	SuperAdmin	ernesto.jesus.villal
5	F203406	Victor Hugo Garcia	User	victor.hugo.garcia
6	F331278	Raul Felipe Hernandez Vela	User	raul.felipe.hernanc
7	F453332	Alma Delia Gutierrez SANC.	User	alma.delia.gutierr
8	GORTIZ6	Gonzalo Diego Ortiz	SuperAdmin	GOrtiz6@slb.com
9	MRODRIGUEZ110	Martin Luis Rodriguez	SuperAdmin	MRodriguez110@
10	SUPERADMIN	super super	SuperAdmin	
11	USUARIO	usuario usuario	User	
12	USUARIO1_BAKAB		User	
13	USUARIO1_CHEEK		User	
14	USUARIO1_ESAH		User	
15	USUARIO1_KU		User	
16	USUARIO1_LUM		User	
17	USUARIO1_MALO...		User	
18	USUARIO1_XIKIN		User	
19	USUARIO1_ZAAP		User	
20	USUARIO2_CHEEK		User	
21	USUARIO2_ESAH		User	
22	USUARIO2_XIKIN		User	
23	USUARIO3_CHEEK		User	
24	USUARIO3_ESAH		User	

Results

Current system users in PEMEX



Subdirección de Recursos Prospectivos y Auditoría de Reservas de Hidrocarburos
Gerencia de Análisis y Dictamen Técnico de Proyectos

Bienvenido: Ernesto Jesus Villalobos Luevanos

Menú Principal

- Exploración
- Extracción

Proyecto: A-0369-M - Campo Xanab

Asignación: A-0369-M - Campo Xanab

- Plan de Desarrollo
- Dictamen
 - Modelo estático
 - Visualización de documentos
 - Carga de documentos
 - Validación de documentos
 - Generación de documento final
 - Modelo dinámico
 - Pozos
 - Instalaciones
- Aplicaciones Técnicas

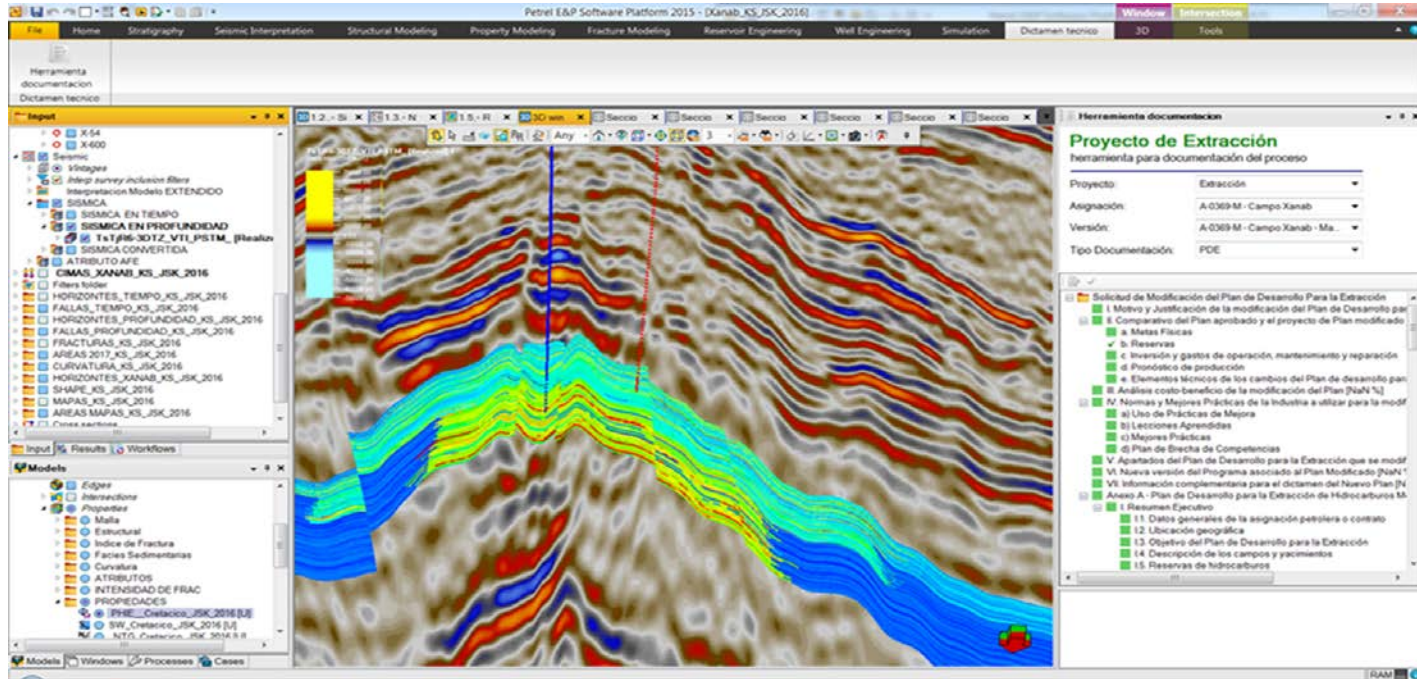
USER_NAME	NOMBRE	ROL	Row Labels	Count of Regular User
317771		317771 Regular User	GDT	24
369500		369500 Regular User	Power User	176
583776		583776 Regular User	Reader	7
531162	Aaron Medina Ramirez	Power User	Regular User	49
525638	Aaron Retana Pérez	Power User	Writer	31
511540	Abraham Chavez Ramirez	Power User		
Grand Total				287

Asignación: A-0369-M - Campo Xanab

Map showing location: Barra de Tupilco, Torno Largo, Chiltepec, Gobernador Cruz, El Bellote, Meacoacán, Reserva Ecológica Rio Playa, Laguna de la Machobá, Tabasco.

Results

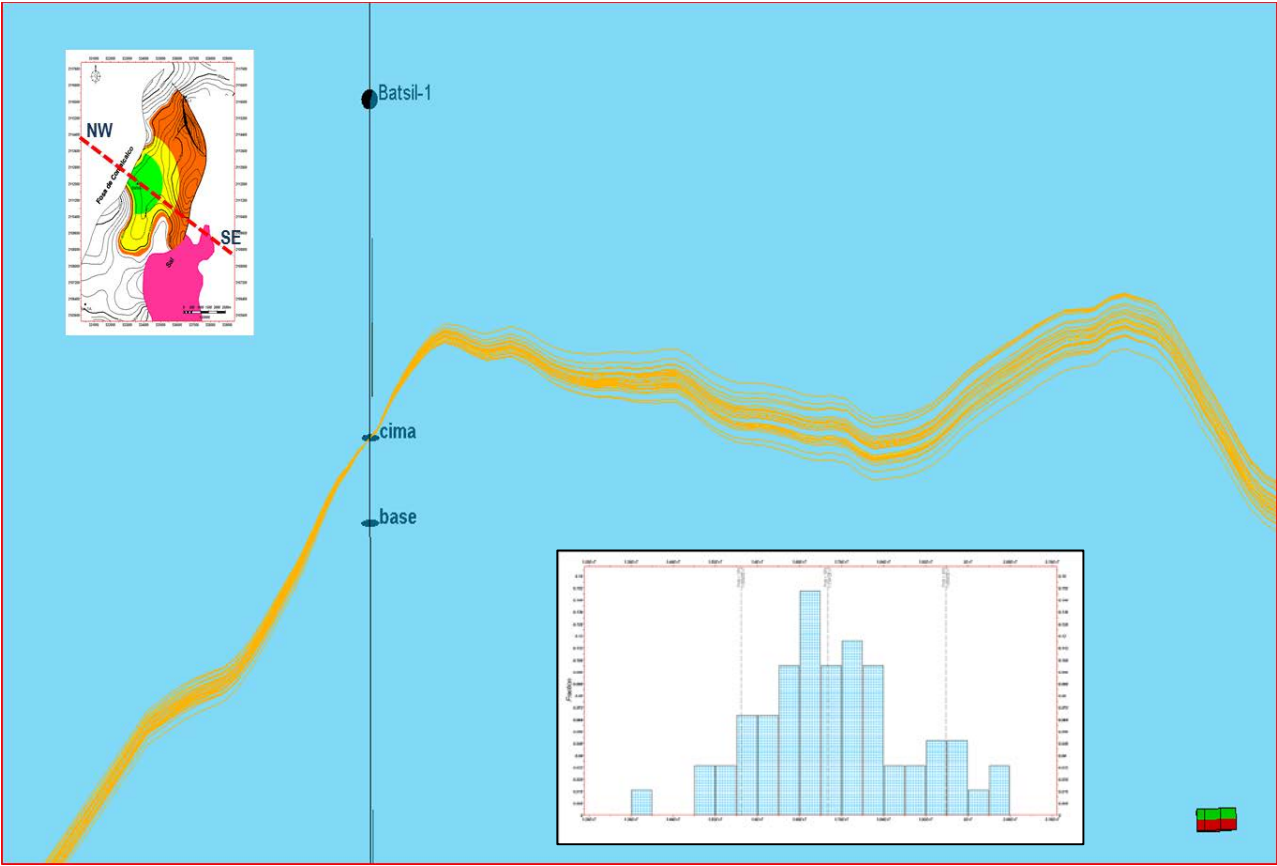
Documents loaded into the system



1096	A-0195-M - Campo Los Soldados	A-0195-M - Campo Los Soldados	May2017	II.5.3 Análisis de discontinuidades naturales	Yahana Hernández Mendoza
1097	A-0195-M - Campo Los Soldados	A-0195-M - Campo Los Soldados	May2017	II.5.3 Análisis de discontinuidades naturales	Yahana Hernández Mendoza
1098	A-0195-M - Campo Los Soldados	A-0195-M - Campo Los Soldados	May2017	II.5.3 Análisis de discontinuidades naturales	Yahana Yamili Hernandez
1099	A-0145-M - Campo Guaricho	A-0145-M - Campo Guaricho	May2017	VII.1. Identificación de riesgos	Eduardo González Carmona
1100	A-0145-M - Campo Guaricho	A-0145-M - Campo Guaricho	May2017	VII.2. Evaluación de los riesgos	Eduardo González Carmona
1101	A-0145-M - Campo Guaricho	A-0145-M - Campo Guaricho	May2017	VII.3. Jerarquización de riesgos	Eduardo González Carmona
1102	A-0145-M - Campo Guaricho	A-0145-M - Campo Guaricho	May2017	VII.4. Mitigación de riesgos	Eduardo González Carmona

Results

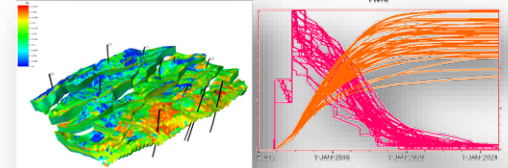
Uncertainty in the fields



Benefits

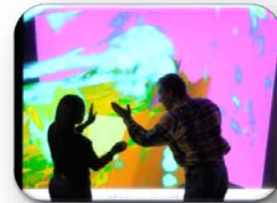
▪ Technical

- Coordinate system homologation for projects (according to CNH regulation)
- Homologated projects documentation
- Clean and FEL standardized projects with a versioning control
- A unique data and knowledge repository centrally administrated



▪ Economical

- Risk and uncertainty decrease on dictated projects
- Projects rentability increase



Benefits

▪ Organizational

- Reserves certification process facilitation
- Positive impact on other stages of PEMEX Value Chain
- A clear role definition among specialists involved in the technical opinion procedure
- Process Transparency and auditable...promoting partnership farmouts...
- Highly confidential data security through permission and access control
- Keeping the knowledge and experience of retired specialists...



▪ Process

- Knowledge and lessons learned sharing (less re-work, traceable results)



Conclusions

- Manuals was created in GURU and applied in all PEMEX asset using standards and workflows for to build static models, facilitating the revision of information in the projects
- Exploration and extraction projects are in Studio database, where is possible the collaborative environment between PEMEX Assets, Reviewers and technical experts in any discipline
- The developed Web-page facilitate reporting and evaluating process in the FEL process in Static Models, reducing time and cost of project technical evaluation
- The engineers at the asset can be exchange of experience with network of experts in PEMEX, enhance their technical understanding across Petrel-plugin
- Nowadays the system is used from around 287 user for 400 fields and continuous in expansion...

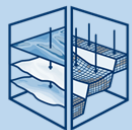
Next steps

Phase I

Phase II

Phase III

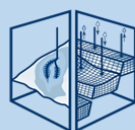
Guides / Documentation



Geology & Modeling



Geophysics



Reservoir Engineering



Production



Economics & Planning



Drilling



Diffusion/
Implementation

Technological solution



"Web Platform"
DOCUMENTATION (DSD)



Plug-in
Documentation



"Web Platform"
SEARCHS
REVIEW / COMMENTS



Administration
Tool



Plug-in
Technical Review
& Advisory

Thank you !

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Gonzalo Diego Ortiz
gortiz6@slb.com

