The Importance of Content Analysis for S1000D Implementation

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FNSS Facilities & Country Offices

Turkey

Oman

Malaysia

Saudi Arabia

Philippines

UAE

Indonesia

Company Structure

- Kocaeli University Technology Development Center – 2010
- Partner with OneStrand since 2014.
- Software Development, LSA Engineering Service, S1000D Implementation

Projects

- MILGEM Corvette
- New Type Patrol Ship (YTKB)
- Submarine Rescue Mother Ship (MOSHIP)
- Rescue and Towing Ship (KURYED)
- Seismic Research Ship
- AY Class Submarine Modernization (AYMOD)
- New Type Submarine (YTDA)
- Multipurpose Amphibious Assault Ship
- Diesel Power Group Development Project
- Armored Combat Vehicle Project

Services

- S1000D Implementation
- IETM and Multimedia
- Configuration and Maintenance Management Software
- Technical Documentation Software
- Logistic Support Analysis

The ACV AD Platform is designed to carry great payloads such as heavy air-defence platforms. The ACV AD Platform also provides ballistic and mine protection. The ACV AD constitutes an ideal platform in terms of command-and-control, largescale mobile radar systems, artillery fire support, and pedestal mounted artillery and missile systems. There are two different variants in this Project.

Development Phase completed - 2 WSV and 1 CCV

Serial Production is ongoing - 40 WSV and 13 CCV (2018-2022)

Project Requirement : Technical Documents in IETP format

Chosen Method : Converting the legacy documents of two types of similar Armed Vehicle Systems to S1000D and generate IETPs.

Inputs

- *9.000 pages of technical content*
  - Operator Manuals
  - Intermediate Maintenance Manuals
  - Depot Level Maintenance Manuals
  - Illustrated Parts Catalogues (IPC)
- IPC in Excel Format
- Illustrations of IPC (.cgm)
- 3D Models of Systems

Outputs

- 2.774 Data Modules
- 4.020 Illustrations (.cgm)
- 307 Multimedia Objects (.mp4)
- 8 Publication Modules

FNSS Technical Documentation Process

Maintainability
- Maintenance tasks
  - Technical descriptions
  - Required conditions
  - Required persons
  - Support equipments
  - Consumables and spares
  - Safety conditions

Usability
- Operator/Crew information
  - Operation procedures
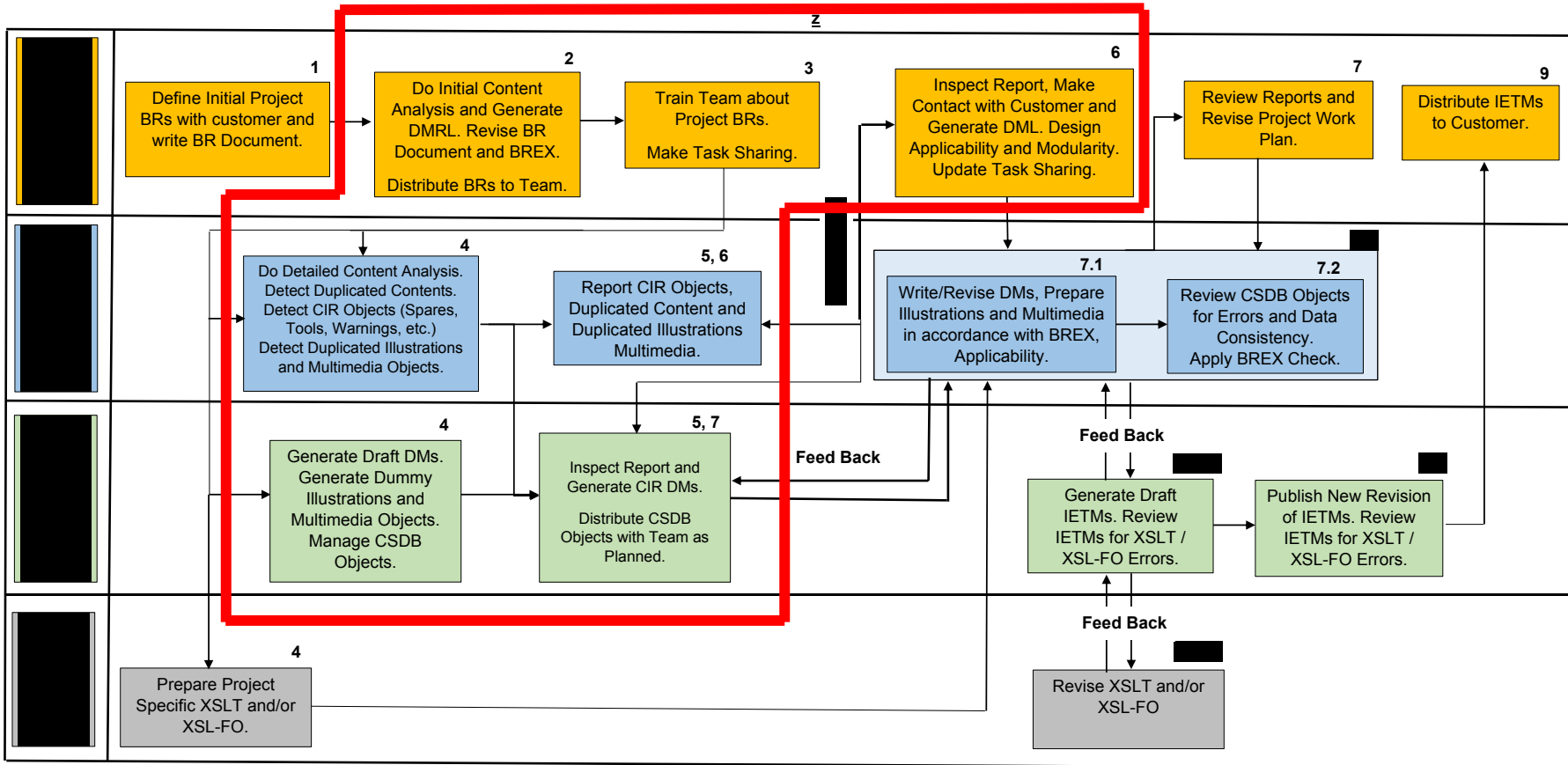 - Controls/Indicators

Reliability
- Fault Information
  - Fault reports
  - Isolation procedures

LSAR DB

Publishing Software

Technical Documentation
- CSDB Management
- Authoring
- Publication management
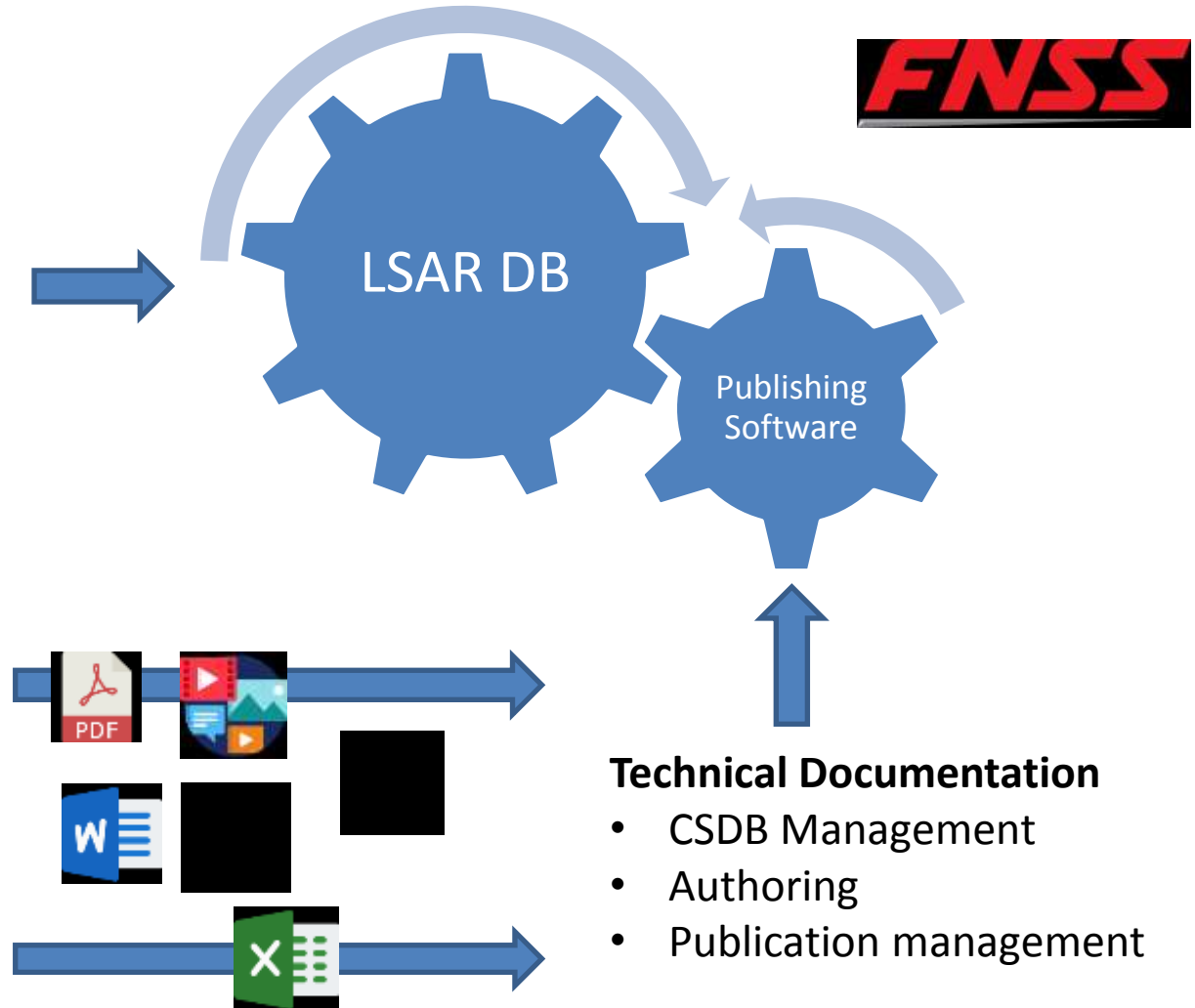
Content Analysis Activities

FNSS

- Prepare Technical Documents as PDFs by using engineering and OEM data
- Create illustrations that support content by using 3D Models
- Update contents in accordance with design activities
- Define Project's animation requirements
- Review and give guidance about Animations

- Define Project BRs
- Define IETM interface and functionality
- Decide what to do about duplicates
- Review IETMs and quality assurance

Viya

- Do Content Analysis on PDFs to detect duplicates and check content/data consistency between PDFs
- Convert Technical Documents to CSDB Objects by using PDFs
- Add hotspots on illustrations
- Revise CSDB Objects in accordance with Revised PDFs
- Design and create Animations that support content by using 3D Models

S1000D Implementation Phases

Planning
- Project BR Development
- Content Analysis
- Applicability Design
- Data Listing and Task Sharing

Authoring
- Generating Draft DMs and Dummy Illustrations
- Writing DMs and Make Quality Checks on DMs
- Creating Illustrations
- Creating Multimedia and Audio Files

Publishing
- Publish Draft Versions of IETMs
- Quality Checks on Draft IETMs
- Feed Back and Revise
- Release IETMs and Distribute to Customer

| Project BR Development | Content Analysis | Applic Design | Data Lists & Task Sharing |

Inputs

Outputs
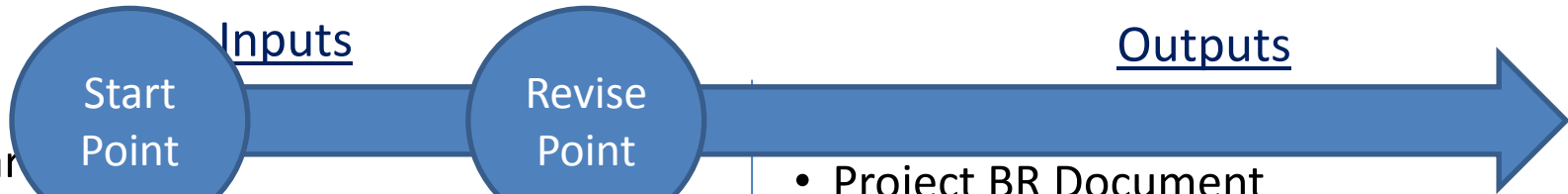
- Start Point;
  - Contractual Documents
  - Project Requirements Document
  - Turkish Army's hardware and software infrastructure
  - Maintenance Concept of Turkish Army
  - BR Document of FNSS
  - BR Document of Viya
- Revise Point;
  - Content Analysis Results

- Project BR Document
  - Project BREX
  - Author Guidebook
  - Illustrator Guidebook
  - Quality Assurance Procedure
  - IETM Functionality and Interface Document
- Training Materials

S1000D Implementation Phases – Phase One: Planning

| Project BR Development | Content Analysis | Applic Design | Data Lists & Task Sharing |

HOW ?

Inputs

- Vehicle Type 1
  - Operator Manual (PDF)
  - Intermediate Maintenance Manual (PDF)
  - Depot Level Maintenance Manual (PDF)
  - Illustrated Parts Catalogues (PDF and Excel)
- Vehicle Type 2
  - Operator Manual (PDF)
  - Intermediate Maintenance Manual (PDF)
  - Depot Level Maintenance Manual (PDF)
  - Illustrated Parts Catalogues (PDF and Excel)

Outputs

- DM Lists (Duplicates included)
- Illustration Lists (Duplicates included)
- Multimedia Lists (Duplicates included)
- CIR Objects Lists
- Define Software needs.
- Plan Task Sharing and Man Hours

| Project BR Development | Content Analysis | Applic Design | Data Lists & Task Sharing |

Steps

1. Inspect IPC documents and build Project SNS structure, list IPC DMs.

SNS Structure

Project BR Development	Content Analysis	Applic Design	Data Lists & Task Sharing

Steps

2. Read and compare all technical documents with each other and;
   - Decide DMs' modularity level,
   - Divide document contents to DMs in accordance with SNS structure and list potential DMs,
   - List potential Illustrations in accordance with SNS structure,
   - List potential multimedia objects in accordance with SNS structure,
   - Mark duplicated contents,
   - Mark contents that can be defined with applicability,
   - Define additional software needs
3. Share lists and notes with FNSS and decide what to do about duplicated content and potential applicability issues.

Project BR Development → **Content Analysis** → **Applic Design** → **Data Lists & Task Sharing**

infoName	Vehicle Model	Document Name	Page No (Start)	Page No (End)	Total Pages	techName	MIC	Sys Dif Code	Sys Code	Subsys	Sub-Subsys	Assy	Disassy	Dissasy V	Info Code	Info CV	Item Loc	Schema	Author	Status	Revision Req.	Comment	DMC Code	Uniqe Check	Same as
3.1 KARADA KULLA	Type 1	Operator Man			1,00	ZPTP	ZPTP	AAA	00	0	0	0000	00	AAA	130	A	D	CREW	Doğa	Done	X	Fark yok. / Bu DM'de	DMC-ZPTP-AAA-	Uniqe	
3.1.1 Karada Kulla	Type 1	Operator Man	294,00	297,00	3,00	ZPTP	ZPTP	AAA	00	0	0	0000	00	AAA	130	B	D	CREW	İptal	Cancel		Fark yok.	DMC-ZPTP-AAA-	Uniqe	
3.1.2 Karada Kulla	Type 1	Operator Man	298,00	299,00	1,00	ZPTP	ZPTP	AAA	00	0	0	0000	00	AAA	130	C	D	CREW	İptal	Cancel		Fark yok.	DMC-ZPTP-AAA-	Uniqe	
3.1.3 Eğim Tırman	Type 1	Operator Man	300,00	301,00	1,00	ZPTP	ZPTP	AAA	00	0	0	0000	00	AAA	130	D	D	CREW	İptal	Cancel		Fark yok.	DMC-ZPTP-AAA-	Uniqe	
3.1.4 Eğim İnme	Type 1	Operator Man	300,00	303,00	1,00	ZPTP	ZPTP	AAA	00	0	0	0000	00	AAA	130	E	D	CREW	İptal	Cancel		Fark yok.	DMC-ZPTP-AAA-	Uniqe	
3.1.5 Yan Eğimde	Type 1	Operator Man				ZPTP	ZPTP	AAA	00	0	0	0000	00	AAA	130	F	D	CREW	İptal	Cancel		Fark yok.	DMC-ZPTP-AAA-	Uniqe	
3.1.6 Engel Geçme	Type 1	Operator Man	306,00	307,00	1,00	ZPTP	ZPTP	AAA	00	0	0	0000	00	AAA	130	G	D	CREW	İptal	Cancel		Fark yok.	DMC-ZPTP-AAA-	Uniqe	
3.1.7 Hendek Geç	Type 1	Operator Man	307,00	308,00	1,00	ZPTP	ZPTP	AAA	00	0	0	0000	00	AAA	130	H	D	CREW	İptal	Cancel		Fark yok.	DMC-ZPTP-AAA-	Uniqe	
3.1.8 Mihver Dönü	Type 1	Operator Man	308,00	309,00	1,00	ZPTP	ZPTP	AAA	00	0	0	0000	00	AAA	130	J	D	CREW	İptal	Cancel		Fark yok.	DMC-ZPTP-AAA-	Uniqe	
3.1.9 Aracın Durdu	Type 1	Operator Man	308,00	309,00	1,00	ZPTP	ZPTP	AAA	00	0	0	0000	00	AAA	130	K	D	CREW	İptal	Cancel		Fark yok.	DMC-ZPTP-AAA-	Uniqe	
3.2 SUDA KULLAN	Type 1	Operator Man				ZPTP	ZPTP	AAA	00	0	0	0000	00	AAA	130	A	D	CREW	Doğa	Done	X	*Şekil 3-10. Akıntılı S	DMC-ZPTP-AAA-	Uniqe	
3.2 SUDA KULLAN	Type 2	Operator Man				ZPTP	BBB	0	0	0	0000	00	AAA	161	A	D	CREW	Doğa	Cancel		Fark yok.	DMC-ZPTP-BBB-	Uniqe	
FIGUR 5,02. PARK	Type 1	RESİMLİ YEDE	308,00	309,00	1,00	PARK FRENİ M	ZPTP	AAA	0H	0	5	0200	01	0	941	A	D	IPD	Software			Park Freni değişmiş	DMC-ZPTP-AAA-	Uniqe	
2.4 PARK FRENİ	Type 1	Operator Man				ZPTP	AAA	0H	0	5	0200	00	AAA									Fark yok.	DMC-ZPTP-AAA-	Uniqe	
21.2.1.37 0030-08	Type 1	Depot Level	1121,00	1122,00	1,00	MOTOR, C13 6	ZPTP	AAA	01	0	1	0100	20	AAA	420	C	D	ESCRIPTI	Doğa	Done			DMC-ZPTP-AAA-	Uniqe	
1.3.3 Park Freni	Type 1	Intermediate	90,00	91,00	1,00	PARK FRENİ M	ZPTP	AAA	0H	0	5	0200	00	AAA	040	B	D	ESCRIPTI	Erman	Duplic	işebilir (b	Aynı / Birlikteki görs	DMC-ZPTP-AAA-	Uniqe	DMC-ZPTP-AA
7.1.2 Park Freni	Type 1	Intermediate	414,00			PARK FRENİ M	ZPTP	AAA	0H	0	5	0200	00	AAA	040	C	D	ESCRIPTI	Erman	Duplic	ebilir (bka	Aynı	DMC-ZPTP-AAA-	Uniqe	DMC-ZPTP-AA
2.4.1 Park Frenini	Type 1	Operator Ma	61,00	62,00	1,00	PARK FRENİ M	ZPTP	AAA	0H	0	5	0200	00	AAA	130	A	D	CREW	Doğa	Done	ebilir (bka	Fark yok.	DMC-ZPTP-AAA-	Uniqe	
21.2.1.38 0030-13	Type 1	Depot Level	1121,00	1122,00	1,00	MOTOR, C13 6	ZPTP	AAA	01	0	1	0100	20	AAA	420	D	D	ESCRIPTI	Doğa	Done			DMC-ZPTP-AAA-	Uniqe	
1.3.3.1 Park Freni	Type 1	Intermediate	91,00			PARK FRENİ M	ZPTP	AAA	0H	0	5	0200	00	AAA	130	C	D	CREW	Doğa	Duplic	işebilir (b	"b" adımı değişmiş	DMC-ZPTP-AA		DMC-ZPTP-AA
7.1.2.1 Park Freni	Type 1	Intermediate	414,00	415,00	1,00	PARK FREN M	ZPTP	AAA	0H	0	5	0200	00	AAA	130	E	D	CREW	Doğa	Duplic	ebilir (bka	Aynı	DMC-ZPTP-AAA-	Uniqe	DMC-ZPTP-AA

Overlaid annotations:
- Revised as 1 DM
- Initially planned as 9 DMs for modularity
- Revised as 1 DM and used Applicability
- Initially planned as two seperate DMs (Same content but different vehicles)
- Defined in list for tracability
- Defined in list for tracability

Project BR Development	Content Analysis	Applic Design	Data Lists & Task Sharing

Inputs

- Content Analysis Results
  - DM Lists
  - Illustration Lists
  - Multimedia Lists
- FNSS authority

Outputs

- Applicability Cross-Reference Table (ACT)
- Conditions Cross-Reference Table (CCT)
- Products Cross-Reference Table (PCT)
- Applicability Implementation Guide

Project BR Development → Content Analysis → Applic Design → Data Lists & Task Sharing

Inputs

- Content Analysis Results
  - DM Lists
  - Illustration Lists
  - Multimedia Lists
- FNSS authority

Outputs

- DM Lists (Duplicates included)
- Illustration Lists (Duplicates included)
- Multimedia Lists (Duplicates included)
- CIR Objects Lists
- Distribute lists to Team and make assignments

| Project BR Development | Content Analysis | Applic Design | Data Lists & Task Sharing |

infoName	Vehicle Model	Document Name	Page No (Start)	Page No (End)	Total Pages	techName	MIC	Sys Dif Code	Sys Code	Subsys	Sub-Subsys	Assy	Disassy	Dissasy V	Info Code	Info CV	Item Loc	Schema	YAZAR	Durumu
FIGUR 15. SİS HAVANLARI MO	Type 2	RESİMLİ YEDEK PARÇA	390,00	391,00	1,00	SİS HAVANLARI MO	ZPTP	BBB	15	0	0	0000	01	0	941	A	D	IPD	Software	
2.35 SİS HAVANLARI	Type 1	KULLANICI VE KULLANI	207,00	209,00	2,00	SİS HAVANLARI MO	ZPTP	AAA	15	0	0	0000	00	AAA	040	A	D	ESCRIPTI	Doğa	Bitti
2.35 SİS HAVANLARI	Type 2	KULLANICI VE KULLANI	206,00	209,00	3,00	SİS HAVANLARI MO	ZPTP	BBB	15	0	0	0000	00	AAA	040	A	D	ESCRIPTI	Doğa	Bitti
22.1 SİS HAVANLARININ TANIT	Type 1	BİRLİK SEVİYESİ BAKIM	905,00	906,00	1,00	SİS HAVANLARI MO	ZPTP	AAA	15	0	0	0000	00	AAA	040	B	D	ESCRIPTI	Doğa	Bitti
22.1 SİS HAVANLARININ TANIT	Type 2	BİRLİK SEVİYESİ BAKIM	909,00	910,00	1,00	SİS HAVANLARI MO	ZPTP	BBB	15	0	0	0000	00	AAA	040	B	D	ESCRIPTI	Doğa	Bitti
2.35.1 Sis Havanı Mermisinin	Type 1	KULLANICI VE KULLANI	210,00	211,00	1,00	SİS HAVANLARI MO	ZPTP	AAA	15	0	0	0000	00	AAA	121	A	D	CREW	Doğa	Bitti
22.1.1 Sis Havanı Mermisinin	Type 1	BİRLİK SEVİYESİ BAKIM	907,00	908,00	1,00	SİS HAVANLARI MO	ZPTP	AAA	15	0	0	0000	00	AAA	121	B	D	CREW	Doğa	Kullanıcıda var
2.35.2 Sis Havanlarının Ateşle	Type 1	KULLANICI VE KULLANI	210,00	211,00	1,00	SİS HAVANLARI MO	ZPTP	AAA	15	0	0	0000	00	AAA	130	A	D	CREW	Doğa	Bitti
22.1.2 Sis Havanlarının Ateşle	Type 1	BİRLİK SEVİYESİ BAKIM	907,00	908,00	1,00	SİS HAVANLARI MO	ZPTP	AAA	15	0	0	0000	00	AAA	130	B	D	CREW	Doğa	Kullanıcıda var
2.35.3 Sis Havanlarının Ateş A	Type 1	KULLANICI VE KULLANI	211,00	212,00	1,00	SİS HAVANLARI MO	ZPTP	AAA	15	0	0	0000	00	AAA	142	A	D	CREW	Doğa	Bitti
22.1.3 Sis Havanlarının Ateş A	Type 1	BİRLİK SEVİYESİ BAKIM	907,00	908,00	1,00	SİS HAVANLARI MO	ZPTP	AAA	15	0	0	0000	00	AAA	142	B	D	CREW	Doğa	Kullanıcıda var
2.35.4 Sis Havanlarının Boşal	Type 1	KULLANICI VE KULLANI	211,00	212,00	1,00	SİS HAVANLARI MO	ZPTP	AAA	15	0	0	0000	00	AAA	151	A	D	CREW	Doğa	Bitti
22.1.4 Sis Havanlarının Boşal	Type 1	BİRLİK SEVİYESİ BAKIM	907,00	908,00	1,00	SİS HAVANLARI MO	ZPTP	AAA	15	0	0	0000	00	AAA	151	B	D	CREW	Doğa	Kullanıcıda var
FIGUR 16. SU TAHLİYE SİSTEM	Type 1	RESİMLİ YEDEK PARÇA	399,00	401,00	2,00	SU TAHLİYE SİSTEM	ZPTP	AAA	16	0	0	0000	01	0	941	A	D	IPD	Software	
2.60 SU TAHLİYE SİSTEMİ	Type 1	KULLANICI VE KULLANI	291,00	292,00	1,00	SU TAHLİYE SİSTEM	ZPTP	AAA	16	0	0	0000	00	AAA	040	A	D	ESCRIPTI	Yalçın	Bitti
25.1 SU TAHLİYE SİSTEMİNİN T	Type 1	BİRLİK SEVİYESİ BAKIM	949,00	950,00	1,00	SU TAHLİYE SİSTEM	ZPTP	AAA	16	0	0	0000	00	AAA	040	B	D	ESCRIPTI	Yalçın	Bitti
25.3 ÖN SÜZ GECİN DEĞİŞTİRİ	Type 1	BİRLİK SEVİYESİ BAKIM	951,00	952,00	1,00	SU TAHLİYE SİSTEM	ZPTP	AAA	16	0	0	0000	00	AAA	921	A	D	ROCEDUR	Yalçın	Bitti
25.4 ÖN SİNTİNE POMPASININ	Type 1	BİRLİK SEVİYESİ BAKIM				SU TAHLİYE SİSTEM	ZPTP	AAA	16	0	0	0000	00	AAA	921	B	D	ROCEDUR	Yalçın	Bitti
25.5 ÖN SİNTİNE POMPASI BO	Type 1	BİRLİK SEVİYESİ BAKIM	955,00	957,00	2,00	SU TAHLİYE SİSTEM	ZPTP	AAA	16	0	0	0000	00	AAA	921	C	D	ROCEDUR	Yalçın	Bitti
25.6 MOTOR BÖLMESİ SU SEVİ	Type 1	BİRLİK SEVİYESİ BAKIM	958,00	959,00	1,00	SU TAHLİYE SİSTEM	ZPTP	AAA	16	0	0	0000	00	AAA	921	D	D	ROCEDUR	Yalçın	Bitti
25.7 ÖN SU SEVİYE SENSÖRÜN	Type 1	BİRLİK SEVİYESİ BAKIM	960,00	961,00	1,00	SU TAHLİYE SİSTEM	ZPTP	AAA	16	0	0	0000	00	AAA	921	E	D	ROCEDUR	Yalçın	Bitti

DMs of a Subsystem

DMs of a Subsystem

Author 1

Author 2

- It was found that 128 pages of content were included in all 6 maintenance manuals.

- 3.835 pages of content is written with applicability concept to prevent duplicated DMs.

- Applicability concept applied to 1.017 DMs.

- 1073 DMs used for both systems technical documents without using applicability.

- 769 duplicated illustrations detected. 4.020 of 4.789 total illustrations are prepared as CSDB object.

Project Plan With and Without Detailed Content Analysis

Without Detailed Content Analysis

- Applicability concept is not used
- 3.789 DMs are written
- 347 Multimedia Objects created
- 4.789 Illustrations created
- 9.000 pages converted to DMs

With Detailed Content Analysis

- Applicability concept is used
- 2.774 DMs are written
- 307 Multimedia Objects created
- 4.020 Illustrations created
- 4.525 pages converted to DMs

- Detailed content analysis has benefits in terms of resource allocation.
  - 25% less DMs
  - 10-15% less multimedia objects / illustrations
  - Early completion of Project (10% savings in total Project time)
- Make sure that 3D models are up to date for animations.

  When the time comes, to avoid delays for obtaining the models.
- Establishment good communication and fast data transfer between the two parties ensure a good follow-up of the project schedule.
- To have a mindset that allows authoring in a way that enables reuse of data provides great advantages.
- Converted legacy data can be used in future projects.

Thank you

for your attention!

Questions?