



고속철도 신호 시스템

PLM 적용 사례

『Windchill Software Tool』

(주) 세화 부설연구소

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(주) 세 화

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1. 고속철도 신호 시스템 Windchill 사용 목적

1-1 고속철도 신호 시스템과 Windchill 적합성

1-2 고속철도 신호 시스템과 Windchill 유용성





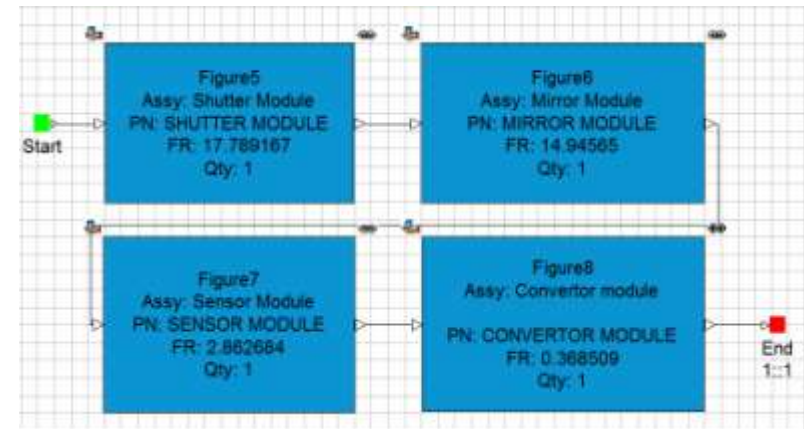
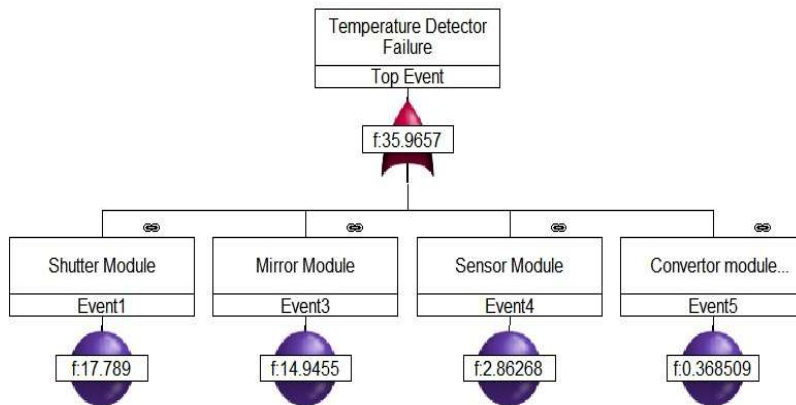
1-1 고속철도 신호 시스템과 Windchill 적합성

**고속철도 신호 시스템 신뢰성 예측 모델 표준 규격
MIL-HDBK-217 지원**

**고속철도 신호 시스템 신뢰성 요구사항을 만족하기 위한
RAMS 활동 수행에 적합**

1-2 고속철도 신호 시스템과 Windchill 유용성

➔ 보고서 및 분석자료 산출물 첨부문서 및 증빙자료 활용



File Name: Wheel Detector.rfp
System: WHEEL DETECTOR
Ref Des:
Description:

Reliability Prediction Summary

Failure Rate: 5.274804
MTBF (hrs): 189,581
Temperature: 30
Environment: GB, GC - Ground Benign, Controlled

Assembly Name	Part Number	Ref Des	Quantity	Failure Rate	MTBF
Wheel Detector	WHEEL DETECTOR		1	5.274804	189,581
Wheel Detector Sensor	WHEEL DETECTOR SENSOR		1	2.148234	465,499
Wheel Detector I/F	WHEEL DETECTOR I/F		1	3.126569	319,839



2. 고속철도 신호 시스템 Windchill 활용

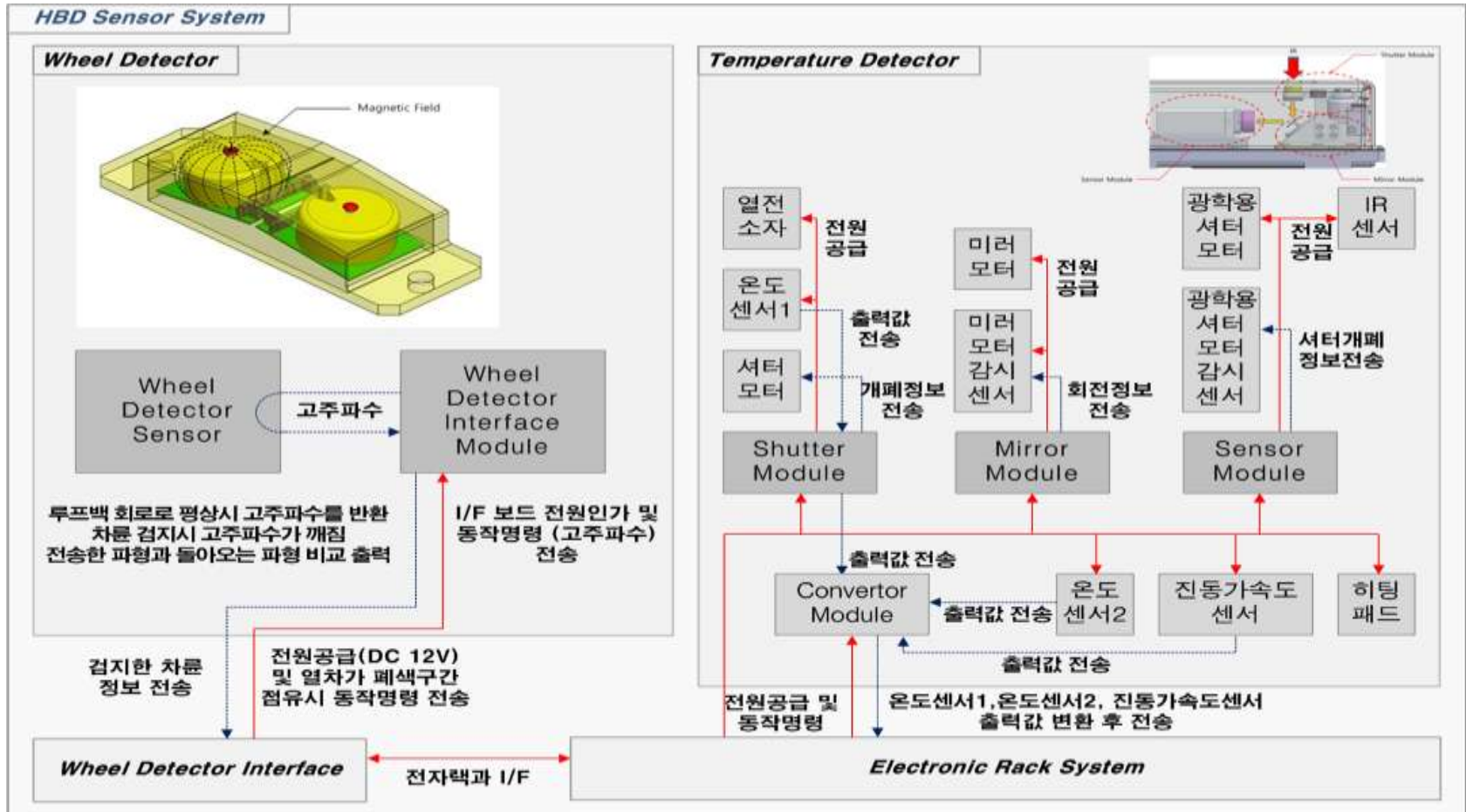
2-1 HBD System FBD

2-2 HBD System Break Down Structure

2-3 HBD System Windchill 활용

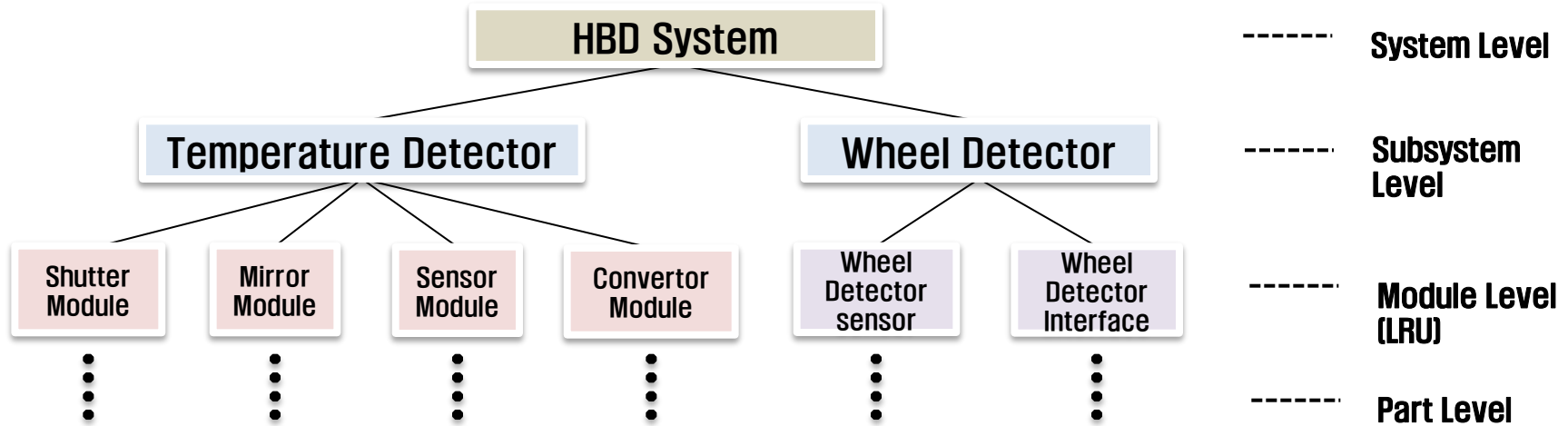


2-1 HBD Sensor System FBD



2-2 HBD System Break Down Structure

➔ HBD Break Down Structure 를 Windchill System Tree 적용



Name	Part Number	System Tree Identifier	Reference Designator	Description	Manufacturer	Failure Rat.	MTRF Predicted	Category	Level	Subcategory
Temperature Detector	TEMPERATURE DETECTOR	System11				27.822048	28439.808000		1	
cable		System8				0.001027	8.73473e+008	Connection	3	General
sensor	M55474 W34	System5			amphenol	0.002055	4.868237e+008	Connection	3	General
vibrating accelerative sensor	4630-050-060	System54		4630 Accelerometer, 50...	measurement spec...	0.520000	1.933077e+008	Accelerometer	2	Strain Gage
heating pad		System85				0.888700	1.129006e+008	Heater	2	Electrical
temperature sensor 1		System86		PT1000ohm		0.447250	2.335886e+008	Sensor	2	Temperature
Shutter Module	SHUTTER MODULE	System7				17.788187	98213.988311		2	
Mirror Module	MIRROR MODULE	System12				14.945650	60000.098640		2	
Sensor Module	SENSOR MODULE	System13				2.862684	3.685224e+008		2	
Converter module	CONVERTOR MO...	System58				0.368509	2.713637e+008		2	

Filter	Name	Part Number	Part Classification	Category	Subcategory	System Tree Identifier	Reference Designator	Quantity	Calculation M...	Tagged IP
1	cable		Parts	Connection	General	System4		1		☐
2	connector	M55474 W...	Parts	Connection	General	System5		2		☐
3	vibrating acceler...	4630-050-0...	EPRO	Accelerometer	Strain Gage	System54		1		☐
4	heating pad		EPRO	Heater	Electrical	System85		2		☐
5	temperature sens...		EPRO	Sensor	Temperature	System86		5		☐



2-3 HBD System Windchill 활용

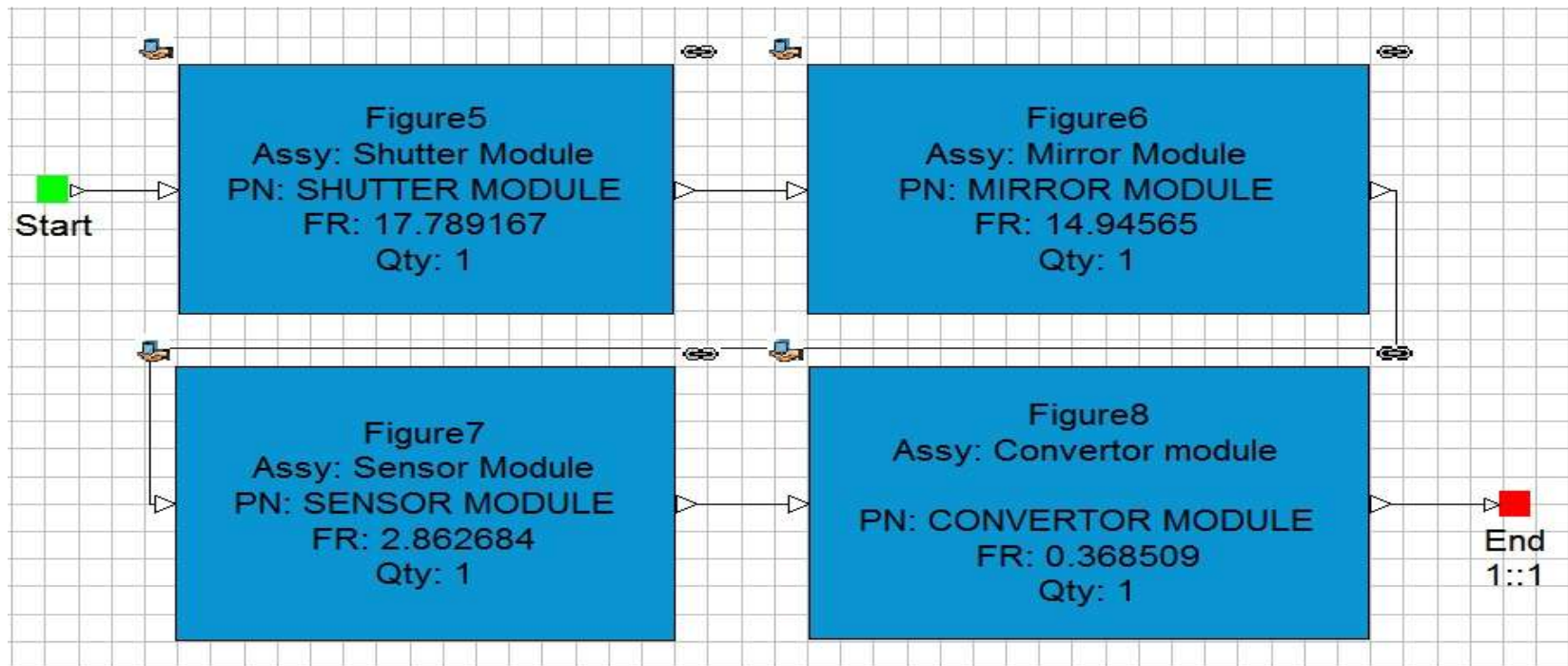
➔ Calculation Data의 표준규격 및 기본적인 운영.환경조건 정의

Calculation Data			
Name:	Wheel Detector	MTTR Type:	Calculated
Calculation Model:	MIL-HDBK-217 FN2	MTTR Specified:	#
Method:	(No Method)	Cost Type:	Calculated
Temperature:	30.00	Cost, Specified:	₩0
Temperature Delta:	#	Failure Rate Type:	Calculated
Environment, 217 / Telcordia:	GB, GC - Ground Benign, Controlled	Failure Rate, Specified:	##
Environment, Dormant:		MTBF Specified:	#
Duty Cycle:	100.00		

Parts Table | General Data | **Calculation Data** | FMEA Worksheet | RBD | Fault Tree Diagram | Event Tree Diagram | Phase Diagram

2-3 HBD System Windchill 활용

신뢰성 예측 모델링 RBD 소프트웨어 지원





2-3 HBD System Windchill 활용

➔ 신뢰성 예측의 결과값

View Calculation Results

Prediction Results

Fault Tree Results

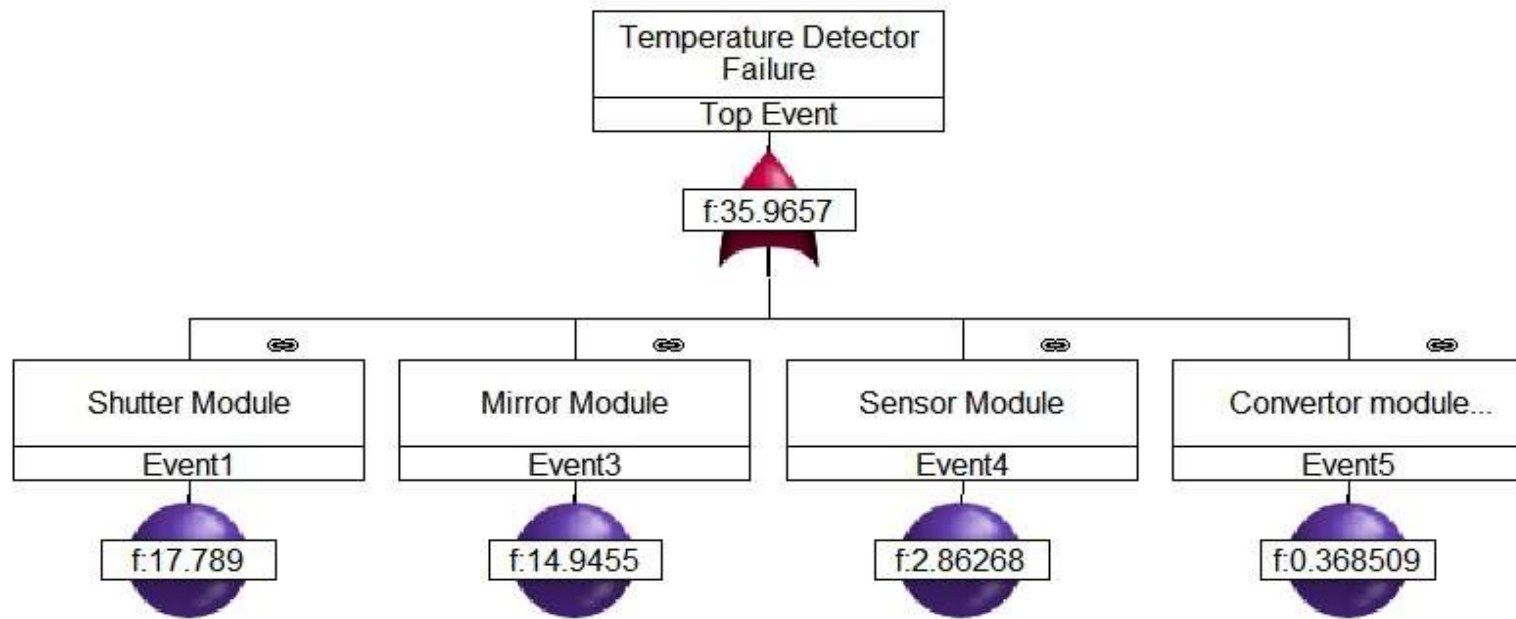
Value	Result
Failure Rate, Predicted	55.611211
MTBF, Predicted	17981.985838
Reliability, Predicted	0.994454
Availability	0.999973
MTTR	0.483312

Close

도움말

2-3 HBD System Windchill 활용

시스템 고장 분석 소프트웨어 FTA 지원





2-3 HBD System Windchill 활용

신뢰성 예측 분석 Report 제공



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감사합니다.

