



INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

TC65: Industrial Automation Forum

Dalian, 29 October 2015



**Interfacing Industry to the
Smart Grid**

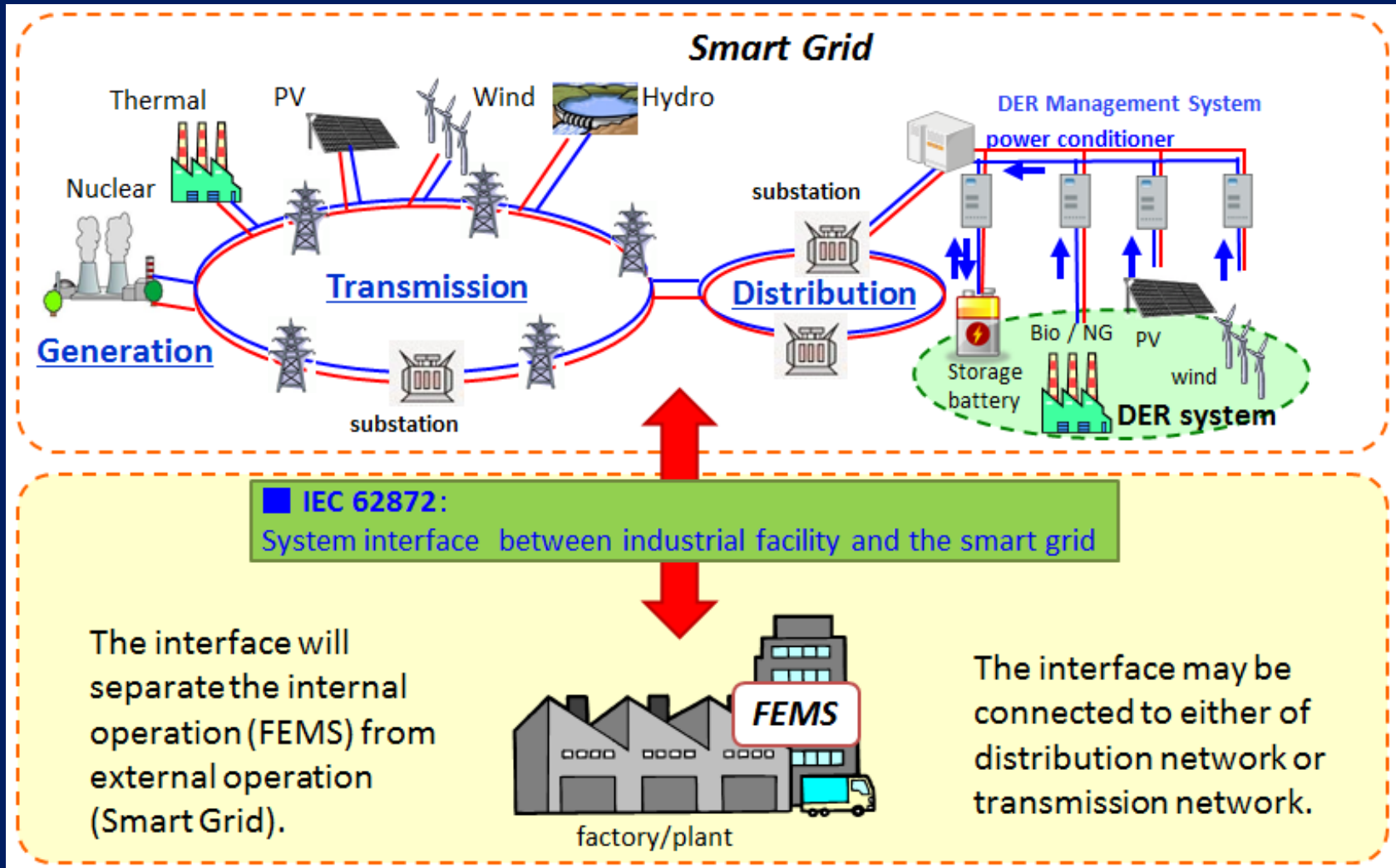
WG17 Toru ISHIKUMA – Convenor



TS 62872/Ed1 “System interface between Industrial Facilities and the Smart Grid”

- **What this TS does for you ;**
 - **To help/guide setting up the information exchanging system needed to support the **planning, management and control of electrical energy flow** between the industrial facility and the Smart Grid**
- **Started May 2013 with 19 members from 10 countries**
 - **Japan, France, Canada, Korea, Germany, China, Italy, Russia, Austria, US**

TS 62872/Ed1 “System interface between Industrial Facilities and the Smart Grid”





Feedback to Smart Grid Roadmap v1.2 (Feb. 2014)

3.4.14 Industrial Automation System

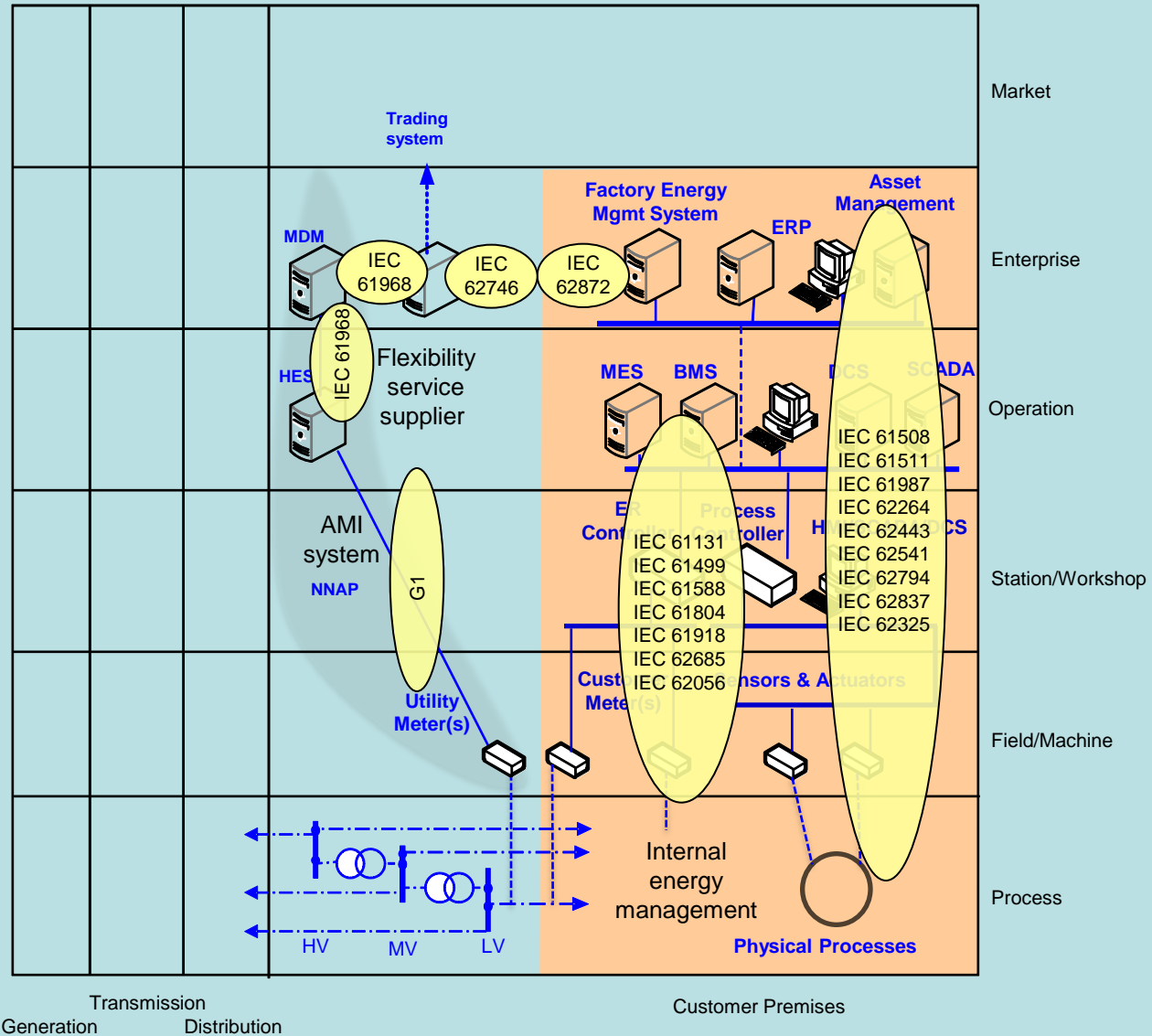


Fig. 56 Industrial automation system - Information layer



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Contents

- 1. Scope**
- 2. Normative references**
- 3. Terms and definitions**
- 4. Abbreviations**
- 5. Requirements**
 - 5.1 General**
 - 5.2 Architecture requirement**
 - 5.3 System interface model between facility and smart grid**
 - 5.4 Security requirements**
 - 5.5 Safety requirements**
 - 5.6 Communication requirements**
 - 5.7 Audit logging requirements**
 - 5.8 Information requirements**

Annex A (Informative) User Stories and Use Cases

Annex B (Informative)

An application example of demand response energy management model

Annex C (Normative) Security Services

Annex D (Informative) Solutions for information requirement

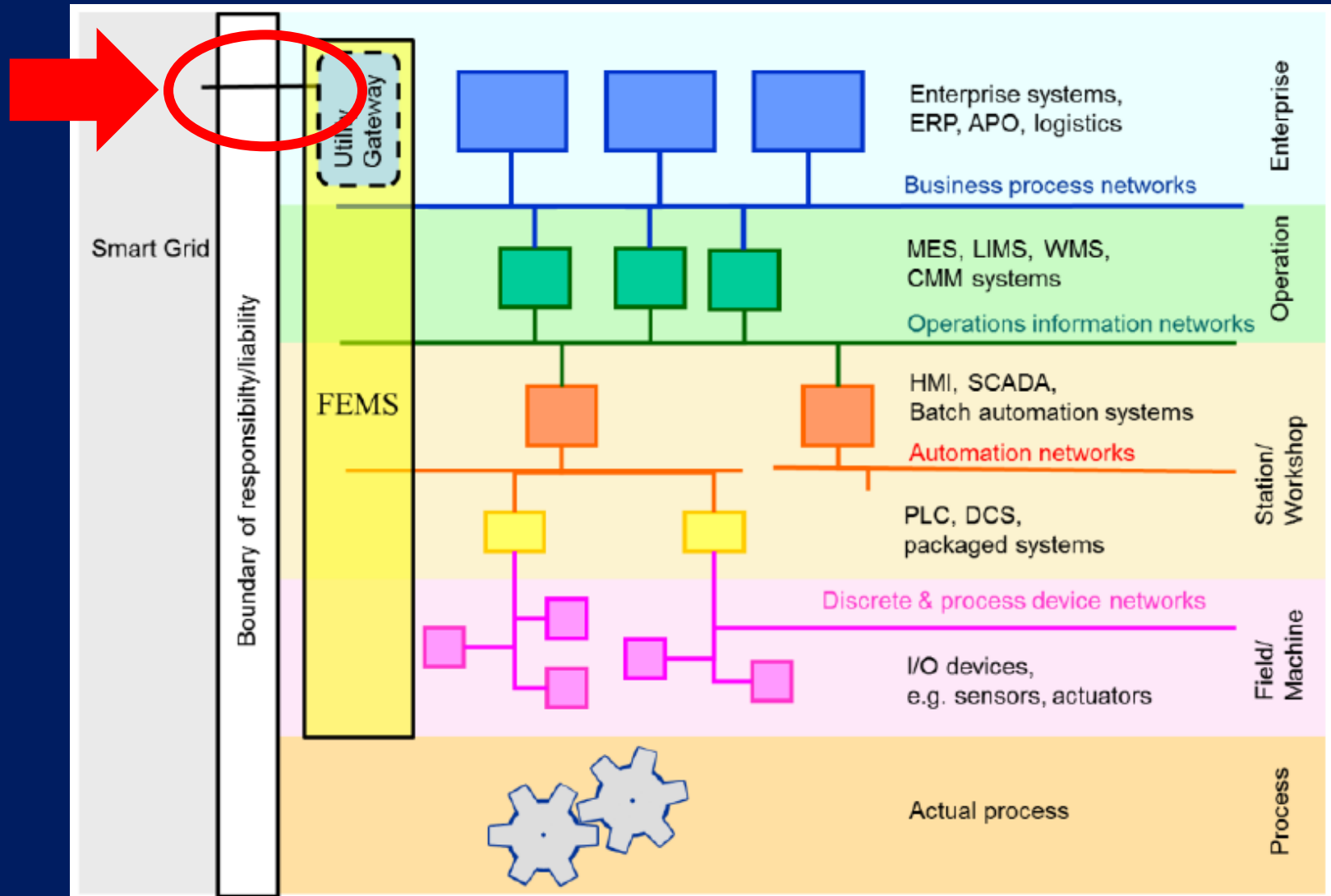


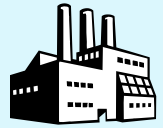
Figure 3 – Facility enterprise and control systems



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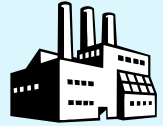
Annex A: Use Cases

1. Facility and Smart Grid obtain current and past energy information

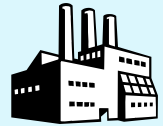


2. Facility provides energy consumption and supply plan to Smart Grid

Periodic info exchange

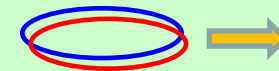


3. Smart Grid provides stable (long term) price schedule to Facility

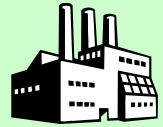
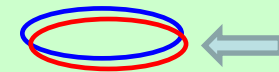


4. Smart Grid provides dynamic (short term) pricing to Facility

Updating plans



5. Facility informs Smart Grid about upcoming consumption and supply

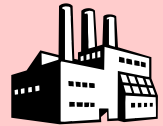


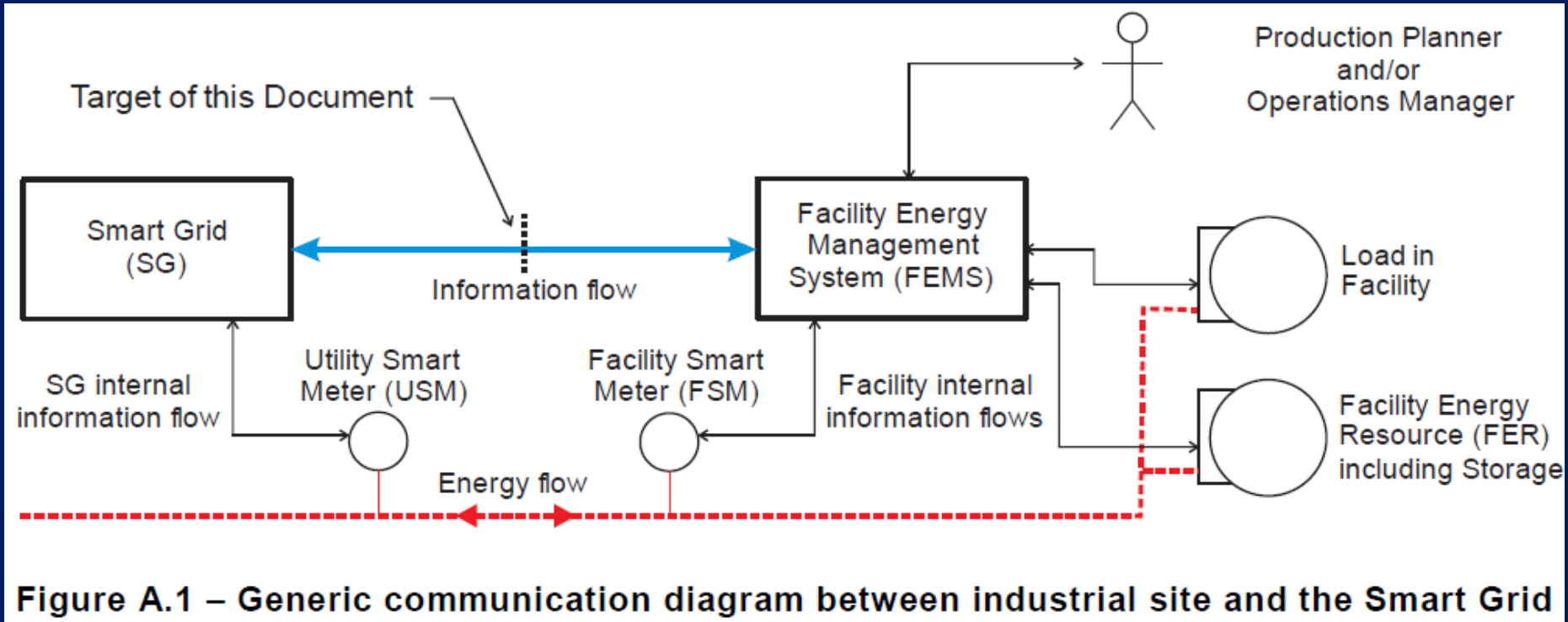
6. Smart Grid informs Facility of blackout notice



7. Smart Grid requests Facility to alter consumption or supply

Emergency notice







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Sequence and exchanged information

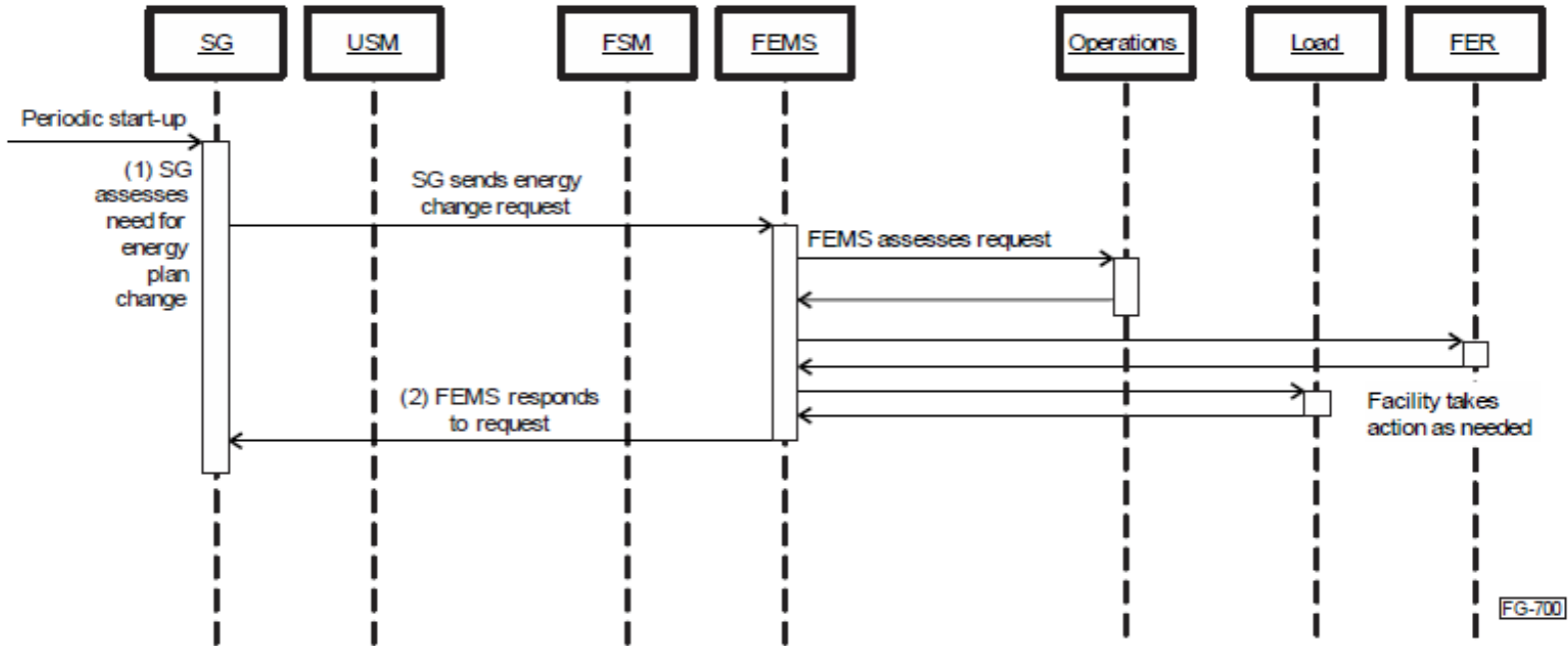


Figure A.8 – Sequence diagram for FG-700

Table A.11 – Exchanged information in FG-700

#	From > To	Action	Semantics
1	SG > FEMS	SG sends energy change request	SG sends request for alteration of energy consumption and supply.
2	FEMS > SG	FEMS responds to to request	FEMS accepts or rejects r

Data examples to be described in 5.8 Information requirements



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5.8 Required information

UC #	Info #	Dir	Function	Freq.	Perf.	Semantic	Example of data transferred
FG-700	1	SG > FEMS	SG sends energy change request	event-based	high	SG sends request for alteration of energy profile.	<p>SG sends energy change request which may include for example:</p> <ul style="list-style-type: none">● Request to reduce (curtail) or increase load, generation, or other energy service according to schedule (start and end times) provided in this request or in previously provided energy plan.● Request to limit consumption by load group or other specification.● Election to consume energy service offered by Facility in a pre-specified energy plan (e.g. SG elects to consume regulation service provided by Facility according to pre-specified energy plan).● Priority of request (degree of urgency).● Updated environmental impact data.
FG-700	2	FEMS > SG	FEMS responds to request	In response	high	FEMS accepts or rejects request. FEMS specifies accepted amount or Group ID depends on contract	<p>FEMS response to energy change request may include for example:</p> <ul style="list-style-type: none">● Acceptance or rejection of request (as previously agreed).

- **Supporting standards and analysis with the Use Cases are listed**
 - **OpenADR 2.0b**
 - **OASIS Energy Interoperation 1.0**
 - **OASIS Energy Market Information Exchange (EMIX)**
 - **OASIS WS-Calendar**
 - **NAESB Energy Services Provider Interface (ESPI)**
 - **SEP 2.0 (IEEE P2030.5) : TBD**
 - **ISO/WD 17800 Facility Smart Grid Information Model (FSGIM)**
 - **IEC 62746 (Under development)**
 - **IEC TR 62939**



- **To make it more practical for implementation**
 - Required information in detail
 - OpenADR analysis in depth
 - Use case / actors coordination with other standards, e.g. in TC57

- **Use Case expansion**
 - Industrial facility's service as PPS (Power Producer and Supplier)
 - Market access
 - Operation of "Heat and Gas"



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THANK YOU!

