Jacobsen Declaration Exhibit AJ
Introduction of ROSA™
Railroad Open System Architecture

Presentation of Goals and Principles
DCC Working Group Meeting
ROSAR Goals

- Realistic Model Railroad Operations
- International Compatibility
- Data Exchange between Applications (ROSA Level 1)
- Cooperation of several Applications in Networks (ROSA Level 2)
ROSABasic Concept: Security Element

- Switch (optional)
- Entry Point A Signal
- Entry Sensor (Trigger Pulse)
- Block Detector (Level Trigger) (optional)
- Entry Point B Signal
- Entry Sensor (Trigger Pulse)
- Entry Point C Signal
- Entry Point C (opt.)
Kompetenz und Sicherheit für Digital-Modellbahner

ROSA Data Structure I

- Trains
- Locomotives
- Cars
- Rolling Stock
- Security Element

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Kompetenz und Sicherheit für Digital-Modellbahner

ROSA Data Structure II

- Trains
  - Locomotives
  - Wagons

- Rolling Stock

- Routes
  - Independant Signals
  - Entry Signals

- Security Element

- Switches
  - Feedback Sensors
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ROSA Data Structure III

- Timetables
- Stopping Tracks
- Routes
- Independent Signals
- Security Element
- Trains
- Entry Signals
- Switches
- Feedback Sensors
- Locomotives
- Cars
- Rolling Stock
- Freight Loads

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ROSA Software Architecture

- Digital Command Control
- Local DB
- ROSA Network Device Driver
- Manufacturer Specific Point-to-Point Interface (ROSA Level 2)
- Digital Command Control
- Local DB
- LAN, WAN
- Manufacturer Specific Network e.g. CAN- or LocoNet-Bus (ROSA Level 2)
- ROSA Network Device Driver
- ROSA Network Device Driver
- Railroad Open System Architecture Database
- ASCII Import/Export (ROSA Level 1)
- Application Software
- User Interface

Digital Systems
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**ROSA Level 1 Application**

- Offline-Data Exchange through ASCII-File
- Point-to-Point Connection (Interface)
- Alternatively connectable Point-to-Point Connection

Digital Command Control

local DB
ROSALebel 2 Application with Model Railroad Network

- Model Railroad
- System Bus, e.g. CAN- or LocoNet-Bus

Digital Command Control

additional ROSA Network

local DB
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ROSA Level 2 Application within DCC Equipment

- Model Railroad System Bus, e.g. CAN- or LocoNet-Bus

Digital Command Control

local
ROSA Component

locale
ROSA Component

locale
ROSA Component

locale
DB

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ROSA Level 2 Application with use of Multiple Network

- Point-to-Point Connection (Interface)
- ROSA Networks, e.g.
  - Local Area Network
  - Local LocoNet
  - Internet
- Point-to-Point Connection (Interface)

Digital Command Control

ROSA Networks:
- Local Area Network
- Local LocoNet
- Internet

Additional ROSA Network
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ROSA Interface Concept

ROSA compatible software application

application interface

**Driver**
Model Railroad Command System Interface

application interface

**Driver**
ROSA-Network-Interface

ROSA DB
Object based communication within ROSA Networks

Diagram:
- **Client**
- **Object Adapter**
- **Network**
- **Request**
- **Object Implementation**
- **Object Adapter**
- **Answer**
• ROSA implements
  – Data Exchange between software applications of different manufacturers
  – Standardized Data Structures and Driver Interfaces

• ROSA allows
  – realistic Model Railroad Operations with stand alone computers as well as in Networks
  – Dynamic Data Exchange between Software Applications and hardware based modules in the model railroad framework