“Hitachi Data Systems was the only storage vendor that was dedicated to solving our business issues, while not trying to dilute the resulting solution.”

Anuraag Bhargava
Electro-Motive Diesel

Electro-Motive Diesel

**INDUSTRY**
Manufacturing: Locomotive, Marine and Petroleum Production; Engines

**SOLUTIONS**
Enterprise Platform, Modular Platform, Business Continuity, Replication

**Hardware** — Hitachi Universal Storage Platform® V (2) and Hitachi Adaptable Modular Storage 500 systems (3)

**Software** — Hitachi Universal Replicator, Hitachi ShadowImage® Heterogeneous Replication, Hitachi Copy-on-Write Snapshot, Hitachi Device Manager, Hitachi Tuning Manager and Hitachi Dynamic Link Manager

**Services** — Provided by Hitachi Data Systems Global Solution Services, including hardware and software implementation or quick start services, the Remote Copy Planning and Design service, project management and a six month technical resident
Engines for marine propulsion, offshore and land-based oil well drilling rigs, and stationary power generation.

On April 4, 2005, General Motors completed the sale of Electro-Motive Diesel to an investor group led by Greenbriar Equity Group, LLC, and Berkshire Partners, LLC.

Business Problem

Electro-Motive Diesel has experienced tremendous data growth since 2005. Data demand came from a SAP implementation, growth in engineering (design of new locomotives, 3D modeling and analysis) and “home grown” applications. In a period of three years (2005 to 2008), their data grew from 2.5TB to 24TB. IT came under new leadership in 2008 and started a transformation from a cost center to a business enabler.

Anuraag Bhargava joined Electro-Motive Diesel as CIO in 2008, after eight years with a premier consulting company servicing accounts in the top 100 of the FORTUNE 500®. He brought his considerable experience and knowledge to the company and changed the business role of IT to that of a strategic information systems organization.

Then, in the spring of 2008, 30 days after Anuraag joined Electro-Motive Diesel, they experienced a catastrophic storage infrastructure failure, with complete loss of all application data. This outage was complicated by the exposure of localized, revenue generating, business applications that depended on the storage area network, but had been hidden from the data recovery processes. The subsequent restoration from tape took days.

Anuraag and Hitachi Data Systems went through an intensive evaluation process (29 iterations) to architect a highly scalable and available storage solution. The new solution provides for in-system, local and remote replication. While going through the evaluation and design process, Electro-Motive Diesel realized it had experienced over 20 different IT disasters, including lightning strikes, plumbing leaks, and power and cooling outages, all reinforcing the importance of the resulting solution architecture.

Key Application Needs and Storage Requirements

During the evaluation process, Hitachi Data Systems leveraged a Hitachi Universal Storage Platform® V as the foundation that Electro-Motive Diesel would utilize to achieve their objectives for high availability, storage area management and business continuity.

The value of the Universal Storage Platform was recognized early and would be the foundation on which the company could entrust its business.

About Electro-Motive Diesel

Founded in 1922, Electro-Motive Diesel (EMD) is one of two original equipment manufacturers of diesel-electric locomotives in the United States (www.emdiesel.com). Headquartered in LaGrange, Illinois, with additional facilities in London, Ontario, Canada, Electro-Motive Diesel designs, manufactures and sells diesel-electric locomotives for all commercial railroad applications. Its products have been sold in more than 70 countries worldwide.

Electro-Motive Diesel is the only diesel-electric locomotive manufacturer to have produced more than 70,000 engines. They have the largest installed base of diesel-electric locomotives in North America and internationally. In addition to its locomotive manufacturing activities, the company has an extensive aftermarket business, offering replacement parts and a range of value-added services for its locomotives. The company is also a global provider of diesel engines for marine propulsion, offshore and land-based oil well drilling rigs, and stationary power generation.

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High Availability

- **The Hitachi Universal Storage Platform V**: After Electro-Motive Diesel incurred a serious outage, 100 percent data availability became the foremost requirement. The value of the Universal Storage Platform was recognized early and would be the foundation on which the company could entrust its business. With this solid foundation, Hitachi Data Systems then architectured a business continuity solution with instant failover capabilities. High application performance (SAP), full redundancy, maximum SAN utilization and complete mitigation against data corruption were the end result.

Storage Management

- **Hitachi Dynamic Provisioning software**: This enabled higher maximum storage utilization, as well as simplified the process of nondisruptively provisioning storage. Benefits included the ability to spread I/O workloads and, in turn, spread I/O activity across all available physical resources. This eliminated the manual process of placing application data over many spindles and predicting I/O patterns that cause contention and bottlenecks.

- **Hitachi Tuning Manager software**: Electro-Motive Diesel wanted the functionality this software provides to proactively monitor performance. Tuning Manager enables surveyed resources analysis, trending and supporting faster application deployment through the planning and forecasting of adequate storage resources.

Business Continuity

- **Hitachi ShadowImage® Heterogeneous Replication software**: This functionality produces a full volume copy that is replicated via Hitachi Universal Replicator software, allowing the Electro-Motive Diesel SAP environment to maximize performance at their production site.

- **Hitachi Copy-on-Write Snapshot software**: Electro-Motive Diesel leveraged this software to ensure against data corruption. Storage capacity was allocated within the Universal Storage Platform V based on a 10 percent daily change rate and will be stored for seven days at the primary site.

- **Hitachi Universal Replicator software**: This journal-based replication functionality was very appealing since the company’s mission critical application was SAP. Electro-Motive Diesel could not afford any performance degradation to their production site. With instant failover as a requirement, the disk-based journals ensured data integrity, reduced cache utilization at the production site and improved bandwidth utilization.

Differentiators

The key differentiator that separated Hitachi Data Systems from its competitors was Hitachi Data Systems Global Solution Services (GSS). Throughout the process, GSS had to scope 29 solution iterations before achieving the optimal solution. The GSS team patiently and accurately scoped each revision, while providing a thorough Statement of Work. During every meeting, GSS personnel were present to review the scope of each service. Electro-Motive Diesel understood that this solution would not be feasible unless the appropriate services were in place to effectively plan, design and implement this complex solution.

The effort invested in the business analysis and associated services was the most important differentiator between Hitachi Data Systems and other vendors. Additionally, Hitachi Data Systems worked with Electro-Motive Diesel to create a unique storage solution for their particular business needs.

The following services from Hitachi Data Systems Global Solution Services were included:

- Implementation Service for Hitachi Device Manager Software
- Implementation Service for Hitachi Tuning Manager Software
- Implementation Service for Hitachi Dynamic Provisioning Software
- Implementation Service for Hitachi Dynamic Link Manager Software (onsite)
- Implementation Service for Hitachi ShadowImage® Heterogeneous Replication Software
- Implementation Service Hitachi ShadowImage® In-System Replication Software Bundle
- Remote Copy Planning and Design Service
- Implementation Service for Hitachi Universal Replicator Software

Both a dedicated project manager and a dedicated six-month technical resident were also included with the GSS services.

Electro-Motive Diesel’s Resulting Confidence

The Vice President and General Counsel of Electro-Motive Diesel, Tom Rissman, as a stakeholder in the company, reports that he sleeps better knowing that a fully redundant business continuity infrastructure has been set in place. He relies on the solution to ensure proprietary information of this company is protected against data corruption and any natural disasters.

Electro-Motive Diesel’s CIO, Anuraag Bhargava, leveraged the Hitachi Data Systems solution to meet his initial initiatives. He sought a highly available, business continuity solution with instant failover capabilities that ensure against data corruption while allowing maximum SAN utilization and performance. Electro-Motive Diesel has seen “read” speeds increase from 30 to 50 percent and has reduced batch processing time by up to 75 percent. He also has gained the flexibility to handle future initiatives, such as mergers and acquisitions, deployment of new applications and the ability to tier those requirements.