HP Data Center Facility Consulting

Planning and Implementing Data Center Projects Worldwide

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Data Center Facility Consulting EMEA
Agenda

• Worldwide Data Center projects – Things to consider
• How to ensure quality and success
• HP’s approach
• Examples

Wynyard DC, England
HP Technology Consulting – Data Center Facilities

Technology Leadership

- Large market share in the DC (Servers, Storage, Networking, Software)
- Design of more than ~5 Mio m² DC whitespace (market leader)
- 40+ MW Class Data Center
- Research and development for data centers
  - HP Performance Optimized DC (POD)
  - Multi-Tier-Hybrid-Design
  - First “out of the box” data center (Flex-DC)

Energy Services

HP Critical Facilities covers the entire data center Lifecycle

- More than 300 Data Center engineers and consultants worldwide
- Hundreds of successful transformation projects
- 8.300 certified ITIL-Experts, 10.200 Linux-Experts
- 28.900 certified Microsoft-Specialists
- WW leading in IT consolidation projects
- Strategic Alliances with SAP, Microsoft, VMWare
Worldwide Data Center projects –

Things to consider
Worldwide Data Center projects: **Planning**

- Different norms and regulations in basically every country

Worldwide Data Center projects: **Legal**

- License required for obtaining authority approvals
- Civil code of countries
Worldwide Data Center projects: Financial & Purchase

• Project budget and cost control
• Availability of equipment and material
Worldwide Data Center projects: **Project Management**

- Project management

Worldwide Data Center projects: **Local ‘flavor’**

- Cultural background
- Data center market maturity
How to ensure quality and success?
How to ensure quality and success?

- DC design and project management from Germany only will not be successful
- Knowledge about local standards and norms is essential
- Daily local presence required for project management

Quality Assurance

- Internal Check
- SME 30% 60% 90% Process Review
- Client/3rd Party Audit
- Finalized Submission to Client
Steps towards a successfully international project

1. Identify a partner company which is taking overall responsibility

2. Find trustful and reliable subcontractors in the designated country

3. One Project Management Office as single instance of contact and decision making for German and foreign project teams
The HP approach:

Global Data Center Expertise – Local Delivery excellence
Global Data Center Facility Delivery Model

Global Data Center Expertise - Local Delivery excellence

**Country Team**
- Sales
- R&R:
  - Pursuit
  - Project/Program Mgt
  - Purchase Mgt
  - Customer Satisfaction

**Regional Team**
- Technical Experts
- R&R:
  - Conceptual design
  - Testing & commissioning
  - Design management
  - QA/QC

**WW Team**
- Subject Matter Experts
- R&R:
  - Portfolio Development
  - Go to Market & Strategy
  - Enablement, Training & Readiness
  - Expertise Management

**Local partner**
- LDI/Vendor
- R&R:
  - Architecture / Structural
  - Construction
  - Localization

**Off-shore (COE IN/CN)**
- Engineers
- R&R:
  - Detail Design
  - CAD drawings
  - Construction Administration

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<tr>
<td>99</td>
<td>HP CFS Custom Solutions</td>
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**CF STANDARDS**

- **Cover Sheets, Drawing Lists, Title Blocks,...**
  - Include both AutoCAD and REVIT formats.

- **DWG Symbols and Abbreviation**
  - Get directly from CFS symbols.

- **Detail Drawings**
  - Displayed in the CFS standard format.

- **Equipment Details**
  - Organized by discipline. Details are a quick way to educate new engineers as well as being the only element of most all production design projects.

- **Flow diagrams, single lines, control diagrams, riser diagrams, etc. Diagrams shall be both used as training tools for new staff and as a tool to start new drawings.**

- **Equipment schedules, lists, and data sheets sorted by discipline.**
  - Standard template for all new equipment types. Default format Microsoft Excel.
  - Including instructions for inserting into standard CFS CAD format.

- **Forms and templates used for project management.**
  - Including meeting agenda/minutes, weekly/monthly report, letter, fax, RFI, PCR, PVN, etc.

- **Baseline, Formatted, and edited US specifications in both English and Chinese.**

- **This section is a dedicated library to international and domestic codes and standards covering everything to land use permits to construction safety codes.**

- **Training and process documents for completing the standard CFS QA QC process that should be done at all major project milestones.**

- **The primarily purpose of this folder is to provide updates to the team regarding software, computer hardware, and printing. Large software installation files should not be stored here. ME Tools is the primary resource.**
Quality Management

Quality Assurance

- Internal Check
- SME 30% 60% 90% Process Review
- Client/3rd Party Audit
- Finalized Submission to Client

Quality Control

- Approval
- Check
- Design

3-level Discipline Internal Review

- Architecture
- Electrical
- Disciplines Cross Check
- Plumbing / Fire Protection
- Low Voltage / BMS
- HVAC
- Review Tools
- Color Coding

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Example: Shanghai / China
Climate Location – Shanghai, CHN

Hourly temperature is used primarily for energy use simulations and the maximum monthly temperature is used in sizing cooling equipment.
Plotting the hourly temperature and moisture values on the psychrometric chart, it becomes apparent that a large number of hours per year fall outside the ASHRAE recommended temperature and moisture envelopes. Keeping the supply air temperature as high as possible and optimizing the economizer strategy will yield outstanding levels of energy efficiency.
Note: assumptions on lighting loads, miscellaneous power, occupancy schedules, etc. have been made in this analysis in order to represent a realistic energy usage of a data center. These assumptions are used throughout the analysis.
Summary of Cooling System Alternates – Shanghai, CHN

Energy Use Comparison of HVAC System Alternates

Note: assumptions on lighting loads, miscellaneous power, occupancy schedules, etc. have been made in this analysis in order to represent a realistic energy usage of a data center. These assumptions are used throughout the analysis.
Project management issues – Shanghai, CHN

- Different understanding of data center best practices
- Cultural background
- Communication differences
- Language difficulties
- Time shift
HP References

Worldwide Data Center Projects
Government Data Center The Hague Netherlands

Available Sustainable Scalable Secure Flexible Economical

- Datacenter serving 5 ministries and other government departments
- Design, Build and Maintain a new data center (brownfield)
  - 2700 m²
  - 8 MW in 6 data halls
  - 5 stages
- Consortium set up with installation company, lead by HP
- HP selected out of >10 competitors
- Equal to or better than the competition for all criteria
- Energy efficiency: “Free Cooling”, adiabatic assistance, PUE <1.12
- Tier III availability, no SPOF’s
- Highest level of physical security
HP POD Installation Airbus Hamburg und Toulouse

**Key Requirements**

- Data Center consisting of 3 IT containers per site
- 460 kW / Container, N+1 resilience
- Power, cooling and IT containers
- Fast Track schedule (initial 21 weeks/ upgrade 3 days)
- Full design & build
- Harsh environment
# France Telecom

**Key figures:**
- 2 campus of 2 buildings each
- Each building is 10 MW IT
  - 4 data halls of 1000 m² @2.5kw/m²
- Direct free cooling
- Feasibility study
- Design
- Implementation
- HP as head of the consortium

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<tr>
<th>Customer Objectives</th>
<th>HP Solution / Approach</th>
<th>Customer Benefits</th>
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<tr>
<td>Evolve to NGDC: « An environment available 24x7, built with industry-standard modules, operated thru automated procedures, offering very high service levels, reducing operating expenses »</td>
<td>Comprehensive consulting and project management approach, in consortium with a local architect and a building / structure company.</td>
<td>Robust design, Tier III+</td>
</tr>
<tr>
<td>- Robustness, resilience and security</td>
<td>- Full range of services: concept design, detailed design, detailed specification and constructors selection, construction management, commissioning</td>
<td>- Optimal energy balance and PUE +/− 1.2</td>
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<tr>
<td>- Optimization / reduction of TCO</td>
<td>- HP DCFC focused on key technical environments: Mechanical, Electrical, Plumbing, BMS, Security, Fire Protection…</td>
<td>- 30% energy saving versus standard design ➔ pays back first year datacenter CAPEX investment in 15 years</td>
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<td>- Low carbon impact, Green DC</td>
<td>- HP as head of the consortium during the design phase</td>
<td>- A first data center standard model for future constructions: 1 building to be cloned 4 times</td>
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<tr>
<td>- Very high quality of service</td>
<td>- Online capacity upgrades</td>
<td>- Utilization of latest technologies (Direct Air Free Cooling)</td>
</tr>
<tr>
<td>- Agility to introduce changes</td>
<td>- Very high level of security</td>
<td></td>
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<tr>
<td>- Key figures: 2 campus of 2 buildings each. Each building is 10 MW IT HQ, hosts 4 data halls of 1000 m² @2.5kw/m²</td>
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</tr>
<tr>
<td></td>
<td>- Utilization of latest technologies (Direct Air Free Cooling)</td>
<td>- HQE French certification</td>
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</table>
Sberbank Moscow/Russia

Most eco-friendly and innovative DC in Russia

PUE 1.3

- 5000m2 @ 2kW/m2
- Tier 3 certification
- Electrical topology Tier 4 compliant
- Unique cooling solution, patent pending
- Design of power supply, air conditioning, fire protection, M&E systems
- Project Management

Opening by Russian prime minister Nov 2011

Datacenter Dynamics EMEA Awards 2012
Winner in category „Innovation in the mega data center“:

Sberbank Mega DC 1
Tadawul Headquarter Building
Riyadh, Kingdom of Saudi Arabia

Project Outline
- Located in Saudi Arabia’s financial center in Riyadh, stock exchange
- Building chosen in an international competition, the exterior is equipped with louvers to allow for both panoramic views and shielding against the heat of the sun
- Design mobilizes numerous state-of-the-art technologies to assure sustainability in the desert environment

Data Center
- Building Design by Nikken Sekkei
- Data Center Design By HP Data Center Facility Consulting
  - Certified Uptime Institute Tier IV
  - 1400m² High Density Capable White Space
  - Data-center, 4th floor, Generator plant on 3rd floor, UPS room, 5th floor & MV Room on 6th floor.
Design, build, finance & maintain project
First Tier III certified data center in Central Asia

- 1000m² / 380 Racks
- Tier 3 certification
- DC Design
- Quality Assurance (construction support and advise)
- Test & Commissioning
- IT Cloud solution, Network design
- Financing
  - **DC IAAS** - infrastructure as a service
  - IT infrastructure as a service
- DC infrastructure maintenance services
Why HP?
Data Center Facility Consulting – Value to our customers

Why HP?

Data Center Design expertise and experience
- Designed 5+ million m² of data centers
- Designed 40 of the major Tier 4 Greenfield DC’s
- Designed six 40 MW + data centers
- Local Uptime Institute accredited engineers
- Industry leader in the design of energy-efficient, “green” Data Centers with LEED APs and BREEAM Assessors
- More than 300 DC engineers and consultants worldwide

Full Data Center Lifecycle coverage
- From strategic consulting to DC operation
- Trusted advisor for all project stages

Integrated IT and Facilities Solutions out of one hand
- HP is the only company which can provide this
- Incorporation of Network and IT design into DC projects
- Anticipation of IT trends

HP’s geographical reach and brand
- Experience from projects world wide
- International project delivery, local presence

HP's geographical reach and brand
Thank you!