Projected Shinkansen Workflow from Planning to Service Launch

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Projected Shinkansen workflow from planning to construction

Consulting with the operator from the stage of drawing up the Construction Implementation Plan to construction completion in view of future railway operations and maintenance.
### Shinkansen Development Plan

MLIT Minister determining a development plan and instructing construction to JRTT

1. Construction line
2. Section
3. Operation method
4. Maximum design speed
5. Approximate cost
6. Others (main en-route locations)

### Construction Implementation Plan

Drawn up by JRTT and submitted to the MLIT Minister for approval

1. Route name
2. Construction section
3. Track locations
4. Total track length
5. Station locations
6. Locations of depots and inspection / repair facilities
7. Construction method
   - a. Minimum curve radius
   - b. Steepest gradient
   - c. Center-to-center track spacing
   - ...  
8. Construction budget
9. Scheduled construction commencement and completion

JRTT consults the operator in drawing up the Construction Implementation Plan
Coordination between JRTT and operator

- From the planning stage to construction, JRTT and JR, which is the future operator, set up an “implementation council” to continuously consult each other on the matters listed below.
- Backtracking on the construction stage can be avoided by compiling the Construction Implementation Plan in consultation with the operator in view of future operation and maintenance.

<table>
<thead>
<tr>
<th>Timing</th>
<th>Examples of matters for consultation</th>
</tr>
</thead>
</table>
| Before construction commencement| • Route name  
• Construction section  
• Detailed track locations  
• Total track length  
• Detailed station locations |
| After construction commencement | • Vertical and plane alignment  
• Types of structures (if requiring changes)  
• Positions of maintenance facilities such as maintenance staircases  
• Use of special structures  
• Height of noise barriers based on surrounding environment  
• Countermeasures for snow damage |
Structure of the Implementation Council and its sub groups

Shinkansen Railway Liaison Council

Shinkansen Railway Construction Implementation Council

- Civil Engineering Facilities Sub-Group
  - Station Facilities Sub-Group

- Snow-Damage Countermeasures Sub-Group

- Track Facilities Sub-Group

- Electrical Facilities Sub-Group

High-level deliberations on the basic construction policy

Detailed deliberations on the following based on the basic policy

- Construction Implementation Plan, etc.

- Snow removal method, snow-damage control facilities, turnout malfunction countermeasures, snow removal on rolling stock depots, wiring at rolling stock depots, etc.

- Construction Implementation Plan, track facilities, development of necessary technologies, etc.

- Electrical facilities, design approach, development of necessary technologies, etc.
Specific consultation example

Maintenance facilities installation plan

- Maintenance ramps: required to bring in road-rail vehicles and transporting materials for facility maintenance.
- Maintenance staircase: for those who carry out maintenance and inspection work.
- From the design stage, JRTT and the operator consulted each other on the installation of maintenance facilities based on the maintenance plan.

One ramp in every 5-7km as a guide (in the case of Hokuriku Shinkansen between Kanazawa and Tsuruga)
Projected Shinkansen workflow from planning to construction

1. MLIT Minister (Adopting the basic plan)
2. MLIT Minister (Designating the researcher and instructing research)
3. Submitting a research report
4. MLIT Minister (Designating the operator)
5. Designation (Designating the constructor)
6. MLIT Minister (Determining the development plan)
7. Construction instruction
8. MLIT Minister (Approving the Construction Implementation Plan)
9. Application Approval
10. JRTT (Drawing up the Construction Implementation Plan)
11. Consultation Agreement
12. JR passenger railway companies
13. Commencement
14. Completion
15. Lease

MLIT Minister: Minister of Land, Infrastructure, Transport and Tourism
JRTT: Japan Railway Technical Institute
JR passenger railway companies: Japanese railway passenger companies
JRTT’s roles in Shinkansen construction

JRTT

- Drawing up an overall construction plan
- Briefing local communities
- Land and geological surveys
- Consulting with local governments, etc.
- Designing structures
- Acquiring lands
- Engaging contractors
- Supervising construction
- Examining completion

Providing control guidance and supervision for the project as a whole

Private enterprises

- Handling individual tasks under JRTT’s guidance and supervision

- Service launch (operator)
- Land / geological survey companies
- Design consultant
- General contractor
- Specialized companies
- Civil engineering work
- Track construction
- Electrical work
- Mechanical work

Service agreement
Lease
Consultation and coordination within JRTT in the construction stage

- Railway operation represents general technology that consists of individual technologies.
- For this reason, in the construction stage, JRTT must not only consult the operator but also engage in consultation / coordination with departments within JRTT in proceeding with the project.

<table>
<thead>
<tr>
<th>Category</th>
<th>Tasks in charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siting</td>
<td>Acquiring land, offering compensation, etc.</td>
</tr>
<tr>
<td>Civil engineering</td>
<td>Building civil engineering structures, etc.</td>
</tr>
<tr>
<td>Tracks</td>
<td>Laying railway tracks, etc.</td>
</tr>
<tr>
<td>Mechanical</td>
<td>Installing rolling stock inspection / repair equipment, elevators, etc.</td>
</tr>
<tr>
<td>Architectural</td>
<td>Building station buildings, electrical buildings, etc.</td>
</tr>
<tr>
<td>Electrical</td>
<td>Installing cables for receiving, feeding and distributing electricity, contact lines, etc.</td>
</tr>
</tbody>
</table>
Coordination between the civil engineering and electrical teams

- When installing electrical facilities, the electrical team must prepare the foundation for electrical equipment and underground conduit for passing through electrical cables in advance.
- For facilities that have the following characteristics, the electrical team must assign the civil engineering team to carry them out. This is called “civil engineering commissioning.”
  - Facilities that are more efficiently installed together with structures by the civil engineering team
  - Facilities that could damage structures if installed by the electrical team
  - Facilities that are more efficiently installed by the civil engineering team due to difference in work timings
• JRTT and the operator also consult each other to determine the position and scale of train crew offices / maintenance yards as well as the scale and specifications of employee training facilities when the operator reaches the stage of considering specific structure and method of maintenance administration.
Various organizations carry out the following audit / inspection to confirm that all railway facilities meet their required performance and specifications. The project schedule must be drawn up and managed in view of not only the construction period but also the timeframe for these inspections, which require a period of over one year in total.

<table>
<thead>
<tr>
<th>Inspector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JRTT (constructor)</td>
<td>Carried out by JRTT’s head office on the applicable regional branch where the construction has taken place according to the Construction Completion Audit Regulations</td>
</tr>
<tr>
<td>JR (operator)</td>
<td>Carried out in cooperation with JRTT to examine the applicable facilities’ finish, conditions and compliance with various standards</td>
</tr>
<tr>
<td>MLIT</td>
<td>Carried out on the railway operator (JR) according to the Railway Business Act</td>
</tr>
</tbody>
</table>
Audit and inspection before service launch

According to Article 10 of the Railway Business Act

Service launch

JRTT

JR

MLIT

Completion inspection

Completion inspection

Ground audit

General audit

Station facility check

Training operation

Cooperation

Ground inspection

General inspection

Station facility check

Inspection application

Inspection application

Ground inspection on facilities

Inspection application

Substation facilities and circuit equipment

Railway facilities other than substation facilities and circuit equipment

Construction completion audit

(approx. 1 and a half years)

(approx. 6 months)

Head office

Head office

JR head office

JR head office

According to the Agreement on Service Commencement

(approx. 1 and a half years)

(approx. 6 months)