

# **SPART**

## **Introduction**

Indian Railways have decided to induct Self Propelled Accident Relief Trains (SPART) with speed potential of 160 kmph, with a view to putting in place a fast and reliable disaster management system.

SPART are trainsets required to proceed to accident sites and are located at important yards and stations on Indian Railways (IR) at vantage locations so as to be able reach the accident spot for rescue and relief work at very short notice.

This specification outlines the requirement for SPART to be procured for Indian Railways. The Contractor shall design, manufacture, test and deliver the SPART as described by this specification.

## **General Information**

### **Accident Relief on IR**

The Indian Railways is having an organized system of relief for managing accidents with its own resources. In most of the countries in the unfortunate event of Railway accident, relief and rescue work is spearheaded by civil authorities as in case of road accidents. However, on Indian Railways, all the rescue and relief work is carried over by Railways.

Presently, 161 ARMVs (Accident Relief Medical Van) and 206 ARTs, (Accident Relief Train) are positioned at strategic locations which cover the entire rail network of Indian Railways for rushing to accident sites on top priority, along with doctors, para-medical staff, rescue workers and engineers. Many ARTs also have 140 Ton Diesel Hydraulic crane attached to them.

The accident is reported by the guard or loco pilot of the train to the nearest station or divisional control room and the nearest railway stations, through telephone sockets provided at the poles alongside the railway track. The control gauges the extent of requirement of relief operations and dispatches the ART and ARMV as per requirement. Effective communication and response time is of essence. The idea is to reach the spot as early as possible so as to provide medical relief in the 'Golden Hour'. The existing layout has provision of 22 berths in the supervisor van however the Indian Railway guidelines say that as many trained staff are to be sent with the relief train as possible. Staff would include team of doctors and paramedics like stretcher bearers, dressers, assistants for boiling instruments in water to keep in readiness etc.

## **SPART Requirement**

For faster initial response and for providing quickest possible medical attention and restoration, it is planned to induct Self Propelled Accident Relief Trains (SPART) capable of 160 kmph speed on IR system.

These will be located at strategic locations so as to cover an area not beyond a distance of 150 to 200 kms within 1 to 2 hours normally.

On receiving information of an accident, SPART will be dispatched to the accident site along with personnel trained in rescue and relief operations. Target time for dispatch of SPART is a maximum 20 minutes from their ordering.

The function of the SPART is to carry medical equipment to the accident site so that prompt medical aid could be rendered and injured persons transported expeditiously to the nearest hospitals.

The SPART will have provision for emergency tools for extricating passengers from debris. Hydraulic Rescue Device (HRD) like Cutters with accessories, Hydraulic pump with generator, Manual pump, hoses etc. ; Hydraulic Re-railing Equipment (HRE) like Jacks with hoses, Re-railing bridges and other Equipment like Ladders, Gas Cutters, Lights, Misc. tools, Inflatable Air Bag etc. are provided in Tool Van (Detail tool list provided at Annexure E) . .

Operation Theatre in medical van is provided for emergency surgery with facilities for tracheotomy, venesection, amputations and other life saving procedures. It also has a state of the art anesthesia apparatus, defibrillator, pulse oxymeter and a cautery. Sterilized dressing material, splints, firstaid, haversack, blankets and clothing for the injured and emergency medicines are also provided. Facility for autoclaving, and sterilization, oxygen supply, artificial respiration equipment and resuscitation kit are also provided (Medical equipment list at Annexure D).

Supervisor Van will have berths for rescue team. It should also carry adequate supply of drinking water and provision for tea, coffee and light refreshment to be served to affected passengers for which a kitchen is provided in SPART.

SPART shall be readily available at all times on a stabling siding set apart exclusively for this purpose, preferably with double exit.

With a view to test the readiness and quick turn out of SPART, it is required to have periodical drills once in every quarter. SPART will proceed upto the mock accident site.

## **Accidents Covered**

SPART will be sent for rescue operation for consequential train accidents. On IR system, consequential train accidents include train accidents having serious repercussion in terms of loss of human life, human injury, loss to railway property or interruption to rail traffic. Train accidents under following classifications will be termed as consequential train accidents:

- a) **Collisions:** This refers to the impact of a train against another train or vehicle. It includes head-on collision, rear collision and side collision.
- b) **Fire in Trains:** A fire in a train should be treated as a train accident only when it results in death or physical injury or loss (damage) of railway property with a value of Rs. 50,000 and above.
- c) **Accidents at Level Crossings:** This refers to a train running into road traffic, and / or road traffic running into trains at level crossings. Level crossing is the intersection of the road with railway track at the same level.
- d) **Derailments:** This refers to the off-loading of wheel or wheels from the track causing detention or damage to rolling stock / permanent way.

## **Vehicle Configuration**

SPART shall be a Diesel Electric Multiple Unit, with speed potential of 160 kmph, on Indian Railways tracks as mentioned in this specification.

It is intended to use these self propelled trains in train length of three cars in bi-directional operation. Each train consist shall be able to couple with similar train consists (SPART) to make a six/car long train configuration, if needed.

Each SPART trainset shall typically consist of three vehicles (Driving car cum Tool Van, a Medical van, and Driving car cum Supervisor's Van) and shall have driving cab at each end. SPART will be equipped with following items depending on type of car:

- a) Tool Van
  - Set of Hydraulic Rescue Device (HRD)
  - Set of Hydraulic Re-Railing Equipment (HRE)
  - Other cutting tools & lighting provisions
- b) Medical Van
  - Medical Equipment and Supplies
  - Operation Theatre and ward for injured passengers
- c) Supervisor Van
  - Kitchen
  - Berths for Supervisors

Contractor will provide SPART fully furnished and fully loaded with equipment for tool van (Annexure E), operation theatre with medical equipment for medical van (Annexure D) and kitchen with cooking equipment for supervisor van. The equipment shall be state of the art, being used in rescue operations

Presently, on Indian Railways the SPART are running in 3 coach formation. The length of 3- coach formation SPART presently running on Indian Railways is 66.6 meter (approx.) Layout drawings of existing three coach SPART is available at Annexure B.

### **Contract Submittals**

This specification requires the submittal of drawings, documents, system descriptions, design calculations and analysis, 3-D models and FE analysis, test results, manuals and similar information for review by IR to verify compliance with requirements specified in this specification and for after-delivery support of the vehicles. Submittal requiring approval are identified in each section. Typically, the RDL (Required Document List) submittals relate to the design requirements in any given sections. Unless otherwise specified herein, the Contractor shall submit all analyses, reports, etc even if they do not appear in the RDL.

The Contractor shall submit for review and approval, a Required Document List [RDL 1-1]. The first draft shall be due as part of the Monthly Progress Report (MPR) within 30 days of NTP. The RDL Status Report shall provide submittal dates and current status of all Contract Deliverables. It shall be structured chronologically such that those deliverables required first are at the top of the list.

## **References to Various Standards**

The standards applicable and relevant to the complete SPART and to the various sub- systems and systems shall be;

- a. IEC publications
- b. EN
- c. UIC
- d. AAR
- e. IEEE
- f. BS
- g. IS and/or
- h. Other standards referred to in Specification and Standards.

In the event of any contradiction in the aforesaid standards, the following standards shall have priority in the order listed:

- i. Standards mentioned in these Specification and Standards set forth herein
- ii. EN/IEC/UIC/AAR
- iii. IS

For avoidance of any doubt, in case of any conflict between the requirements of these standards, the stipulations in this Specifications and Standards shall have precedence.

The SPART and their sub-systems and systems thereof shall comply with the relevant standards as mentioned in this specification.

Latest version of the standards as issued up to 60 (sixty) days before the date of issue of RFP shall be considered for technical evaluation.

The requirements listed in these Specifications and Standards are the minimum. The Contractor may adopt alternative internationally recognized codes, standards and specifications if it can be demonstrated to IR that such alternative is superior or more pertinent to the SPART than the standards specified in these Specifications and Standards. The Contractor shall seek the prior approval of IR for any alternate standards proposed to be used.

## **Engineering Philosophy and Requirements**

The Contractor shall develop the design based on these Standards and Specifications and in accordance with sound proven and good industry practice.

In developing the detailed design, the Contractor shall fully acquaint self and take note of the Group A and Group B train routes of IR and the environmental and operating conditions prevalent therein, especially the monsoon and dusty atmosphere.

The SPART design and construction must be of the highest quality. It must be reliable in performance and economical in operation. Its design must provide for ease of inspection and for convenience of maintenance and repair. All wearing parts shall be easily accessible and readily removable to facilitate maintenance. Identical Similar components shall be completely interchangeable.

SPART shall be designed for a life of not less than 36 years. SPART shall not require major unscheduled repair or replacements of components during normal operation of SPART.

Name brands, specific equipment, or specific materials may be referenced in this specification. Such references shall not be interpreted as pre-approval of any brand, equipment, contractor designs or application. The Contractor shall be responsible for the selection, application, and integration of equipment and materials as necessary to comply with the specified requirements.

The SPART shall be employed for short distance service as well as medium distance service on the existing track and signaling of IR.