International Journal of Engineering Applied Sciences and Technology, 2022
Vol. 7, Issue 9, ISSN No. 2455-2143, Pages 64-66
Published Online January 2023 in IJEAST (http://www.ijeast.com)

ACTIVITIES OF RAILWAY INFRASTRUCTURE WORK IN SEQUENCE BY USING WORK BREAK DOWN STRUCTURE

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Abstract— **Railway infrastructure is complicated to organize due to its numerous challenging planning problems. It is crucial to understand stage by stage approach in project planning. The aim of this paper is to give an overview of railway infrastructure planning through work breakdown structure. Railway based projects using several methods from domestic experiences. It is necessary to standardize work activities implemented for high speed railway project. Work breakdown structure [WBS] can be useful in future rail and rail based construction project. This also minimize the risks, cost and time. Project stages will be obtained in detail than can be used to analyze work activities and resources.**

Keywords— **Railway, Work breakdown structure, WBS, Project management.**

I. INTRODUCTION

Construction Industry is an industry which involves in planning, execution and evaluation. Construction industry can be categorized into three major sectors. Transport and communication sector, water and energy works and buildings and other physical infrastructure. Railway construction is include under transport and communication sector. It is a simply guided path along which trains travels on. The whole railway system includes sub-ballast, ballast, track, slab, bridge, tunnels and other facilities.

A WBS is the starting place for planning the parameters of project like quality, cost and time. It is a technique to divide a project into tasks or work.

There are two types of Work Breakdown structures in project management. First is process-oriented WBS and second is deliverable oriented WBS.

Importance of Planning-

Planning determines what is to be done is under the scope. How it to be done is determined by methods. When it will be done is determined by program. Who is going to do it determine by resources.

How much will it cost by budget.

Railway – The metal lines on which train travels between one places to another. It is also classified as

i. Track or railway road
ii. Station building
iii. Bridges
iv. Signals and telecommunications
v. Bridges

Work Breakdown Structure

It is used to solve each work process in detail. Objectives of WBS is it can determine work project Status report. It can help project managers and project team identify and manage project effectively.

II. METHODOLOGY

Fig 1. Shows each level of WBS, starting from name of project, cluster of work, type of work, work package. Function of WBS is to know order of activities of each work sequence so that no work items can left behind. There are four stages in project management. Planning, Scheduling, organizing and execute. Fig.1 shows the first top level of WBS is project stages. The second is work packages, third level is activities.

Project management is organize by three levels. Each post it or node of your WBS gets numbered in a hierarchical manner. We have label the top level of WBS as LEVEL 1, LEVEL 2 and LEVEL 3.

The next level down, number of each node in WBS sequentially 1, 2, 3 and 4. Next level down in each branch, number sequentially as 1.1, 1.2, 1.3……..And so on 1.1.1, 1.1.2, 1.1.3……

Every post-it or node has its own unique identifier representing its position in WBS.

III. SCOPE

The sequence of railway infrastructure work in Work Breakdown is fixed by levels. We consider technological process for construction of railway infrastructure. The complex technological process indicating sequence through WBS. It is linked by execution on WBS. In our opinion it will be more convenient for calculation of set of work through WBS.

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One of the possible approaches to solving such number of different work in sequence manner may be use of WBS.

LEVEL 1	LEVEL 2	LEVEL 3
1.Planning	1.1 Scope	1.1.1 People involved and enlarged community
		1.1.2 Ensure all risks associated with change are identified and are reduced
	1.2 Method	1.2.1 Telescopic
		1.2.2 Tramline
		1.2.3 Mechanical
	1.3 Program	
	1.4 Resources	1.4.1 Labor
		1.4.2 Equipment
		1.4.3 Material
	1.5 Budget	1.5.1 Cost control manager
		1.5.2 Finance manager
		1.5.3 Cost control manager
2.Scheduling	2.1 Identify activities	
	2.2 Establish relationship	
	2.3 Identify resources	
	2.4 Establish duration	
	2.5 Schedule	2.5.1 Execute summary
		2.5.2 Management summary
		2.5.3 Project coordination
		2.5.4 Execution schedule
		2.5.5 Detailed schedule
3.Organizing	3.1 Specialists	3.1.1 Architect
		3.1.2 Civil and structural
		3.1.3 Mechanical and Electrical
		3.1.4 Quantity surveyor
	3.2 Project manager	3.2.1 Contractor
		3.2.3 Subcontractor
		3.2.4 Nominated subcontractor
		3.2.5 Supply and manufacturer
	3.3 Monitors schedule	3.3.1 Inspection and testing agency
		3.3.2 Quality manager
		3.3.3 Health and safety manager
4.Execute	4.1 Project activities measurement	4.1.1 Against plan
		4.1.2 Performance baseline
	4.2 Project deliverables	4.2.1 Tested
		4.2.2 Accepted
		4.2.3 Approved
	4.3 Time management	4.3.1 Train location
		4.3.2 Real time re-scheduling
		4.3.3 Real time traffic information
	4.4 Communication management	4.4.1 Project identity reports
		4.4.2 Public Website
		4.4.3 Brochure/News
		4.4.4 Events/Social network
		4.4.5 Presentation and publications
	4.5 Risk management	4.5.1 Financial risk
		4.5.2 Political risk
		4.5.3 Site risk
		4.5.4 Material risk

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		4.5.5 Contractual risk
	4.6 Change management	4.6.1 Documentation
		4.6.2 Transparency
		4.6.3 Continuous improvement
		4.6.4 Applying standards

Fig. 1. Levels of Project Management

Work Breakdown structure organize six levels as below.
WBS level 1-Project Name
WBS level 2-Work Group
WBS level 3-Work Type
WBS level 4-Work Package
WBS level 5-Work Activities
WBS level 6-Resources (Labor, Material and Equipment)
Figure 1A shows three different levels of railway infrastructure system. Level 1 is railway project
Level 2 includes legal and finance, civil engineering, building, electrical power, track and signaling and rolling stock. Level 3 include all activities under level 2. Figure 1A shows tree structure organize total scope of project.

WBS Flow diagram -

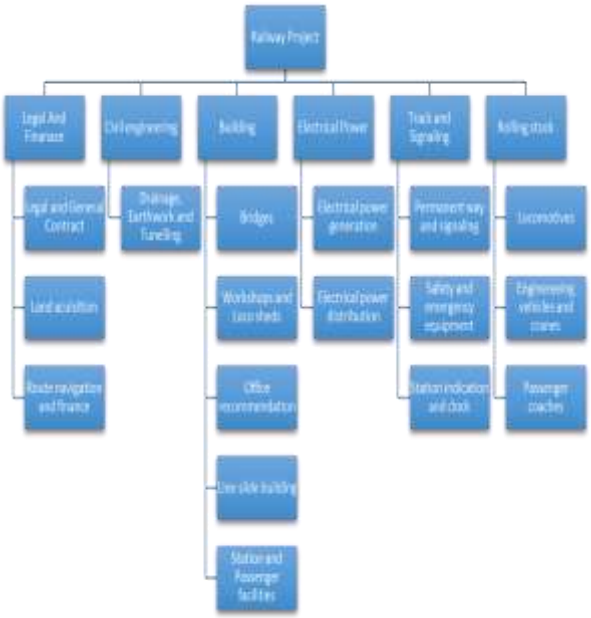

Fig. 2. Railway Project Work Breakdown Structure

IV. RESULTS AND DISCUSSION

The paper shows terms of taking into account the interconnection of processes and the coordination of their movement along the work fronts. This Paper shows an example of formation and calculation of work breakdown structure in construction work, including 49 activity processes in sequence manner.

V. CONCLUSION

The paper discusses the improvement of WBS technique for solving problems in organization of lots different work for Railway infrastructure.

VI. REFERENCE

[1]. Velichkin V.Z., Petrochenko M.V., Zavodnova E.B., Gorodishenina A.Yu, Construction Schedule Planning For Rail Station Facilities, 25 May 2021.
[2]. Humbert Sylvie (SNCF), Barré Antoine (SNCF), Communication Strategy and Action Plan, 5 March 2020.
[3]. Patil Mrunal, Prof. Shinde R. D., Prof. Hailkar S. S., Risk Management in Railway Projects, 4 Feb 2018.
[4]. Siami-Irdemoosa Elnaz, Dindarloo Saeid R., Sharifzadeh Mostafa Work Breakdown Structure (WBS) Development for Underground Construction, 16 June 2015.
[5]. Aryanto D. V., Surpriadi L.S.R., Latief Y., Development of WBS Dictionary and Checklist Based on WBS of Railway Construction for Safety Planning,4 Aug 2020.
[6]. Norman E. S., Bortherton S.H.A., Fried R. T., Work Breakdown Structures: The Foundation for Project Management Excellence, 1st ed. John Wiley & Sons, Canada, 2008 1–25., 24 Oct 2008.
[7]. Carpenter Julie, Project Planning and Review, 10 Dec 2010.
[8]. Saputra Pungky Dharma, Fansuri Muhammad Hamzah, Identification of Precast Box Girder Erection Activities To Develop Work Breakdown Structure In Elevated Railway Infrastructure Project.11 Aug 2021.
[9]. Cerezo-Narvaez Alberto, Pastor-Fernandez Andres, Manuel Otero-Mateo, Pablo Ballesteros-Perez, Integration Of Cost And Work Breakdown Structures In the Management Of Construction Projects.14 Feb 2020.
[10]. Wang Peng, Wei Qiang, Zhao Guotang, Wang Jingchun and Yin Yang, Safety Risk Identification Method for Railway Construction in Complex and Dangerous Areas.22 Oct 2022.
[11]. Burghate Mukul, Work Breakdown Structure: Simplifying Project Management, 5 July 2022.
[12]. Moine Jean-Yves, 3D Work Breakdown Structure Method, April 2013.