
Feature Documentation: Display Tether Routing

for

NASA EVA Path Phase 3

Version 1.1

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i. Revision History

Revision	Author	Date	Description
1.0	Deepali Varma	8/8/18	Initial document.
1.1	Tenadam Weldesemayat	8/12/8	Reviewed Document

1. Introduction

1.1 Background

The NASA EVA Navigator web application delivered from Phase 2 completed tailored backlog items designed by Daren to meet existing objectives for the product. One of the desired functionality remained in the backlog was the display tether routing. In the context of EVA, a tether is a cord or cable that restrains any hardware or person, to prevent it from "floating" away. There are two basic types: One is for hardware and the other is for people. The tethers used to keep people restrained have more safety features.

1.2 Intent

Daren's intent for this change is to provide tether routing and highlight the changes in user interface. The project shall show how astronauts tether routes from the Airlock to them, as they translate around. Toward this goal, he desired to provide better information in regards to each move a space walker will make in the International Space Station model.

1.3 Agreed Change(s)

Display the tether routing in the application. This project will display only the safety tethers used to keep the astronauts safe.

2. Development

2.1 Feature Analysis

Each astronaut carries with them a reel with 85 feet of coiled cable. One end is connected to their space suit. The other end is connected just outside the EV hatch, on the Airlock. As they translate away from the Airlock, the reel tends out more and more cable. If they need to translate more than 85 feet, they bring a second tether and transfer onto it.

Typically, the tether will naturally tend along the structure as they translate out from the Airlock. But in some cases, it might span a valley if they don't proactively pin it down to structure (called

a "fairlead"). At times, their tether may drape across hardware that is sensitive to contact or the hardware may articulate during the EVA. In these scenarios, the astronaut must proactively route their tether around such hazards to avoid damaging the hardware or the tether.

The tether will be represented as a line starting at the Airlock and following the route along the ISS surface to the astronaut, based on how they translated out to their current position. The user can determine a route from point A to point B and can predict where their tether will drag and if it contacts anything hazardous using this application.

3.2 Assumptions and Constraints

3.2.1 Assumptions

It is assumed that the EVA Navigator web application has been setup and launched correctly, following the User_Manual.docx, section 3, Software Installation based on your operating system.

3.2.2 Constraints

The current project does not display airlock position in the model. Without adding all of ISS model it is difficult to implement this requirement.

3.3 Findings

To implement this feature it is required to update current model to include all of ISS (data is provided in 0.2.0 release).