AV Cell Atholville Project Scope and Responsibilities

1. Project Title:

High-Resolution Imaging System for Whiteness and Dirt Contamination Detection at Atholville

2. Problem Statement:

The client requires an integrated imaging solution capable of accurately measuring both the Berger Whiteness Index and Dirt Particulate Contamination of the pulp mat using a single high-resolution camera. The Dirt Contamination Detection solution must comply with ISO 5350-2 2006, operate under high-speed pulp flow conditions, and provide remote configurability and data visualization. The Whiteness Monitoring requirement is to measure the values of whiteness and display those details as a Berger Index.

Challenges with these two tasks include managing lighting requirements, ensuring field scalability, and enabling potential future integrations such as moisture monitoring. In the case of the lighting, the measurement of Dirt Contamination Particulate and the measurement of Whiteness require two wholly different lighting systems, the first being transmitted light, that is light transmitted through the pulp to the camera sensor; the second being reflected light, that is light reflected from the pulp surface to the camera sensor.

3. Scope of Work – Vendor Side:

- Design and integrate a unified imaging system using the JAI SP-45000C-CXP4A-F camera for both whiteness and dirt particulate detection.
- Configure the lighting system control to enable alternate front/back lighting for the pulp to support two required functions.
- Assemble and fully test the complete hardware and software system in Hyderabad.
- Develop a dashboard interface for visualization of:
    - Berger Index (BI) values (Mean, Min, Max)
    - Dirt Particle Contamination Count distributions across the five ISO-defined classes for a 0.5m²
- Provide reports to view historical data on both Berger Index and Contamination.
- Enable remote configuration and system diagnostics through the Edge PC setup.
- Delivered system should be scalable.
- Provision of all documentation, as requested by the designated carrier, for the effective shipment of the system components from Hyderabad to Atholville.

4. Scope of Work – Client Side:

- Procure Edge PC Screen, Keyboard and Mouse.
- Procure and install the LED Lighting Battens, CNSunway 4ft LED 48W 6300LM 6500K Super Bright, D Shape Linkable Utility Light Fixture. Two Battens are to be fitted below the pulp mat and two are to be fitted adjacent to the Camera Enclosure. The LED Battens are to be paired on each side of the pulp mat, they are to be switched using the DPDT relay integrated into the Lighting Timer supplied.
- Procure an Interface Control Cabinet of approximately H 500mm x W 400mm x D 200mm to house the single-phase power feed to the Camera Enclosure and, depending on the arrangement of the lighting supply feed, the Lighting Timer Switch.
- Create an appropriate support structure for the Camera Enclosure, this to be mounted perpendicular to the pulp mat with the camera lens to be approximately 295mm from the pulp mat. (The precise distance will be set according to the details established at the time that the system is created and tested in Hyderabad).

- Run the fibre optic cable provided, from the Range Extender within the Camera Enclosure to the SFP+ Converter within the Edge PC Enclosure. (The SFP+ then feeds the Frame Grabber within the Edge PC).
- Provide full Network Access to the Edge PC to facilitate remote management and data transfer to both the Optimon Platform and the local Pi Platform.
- Coordinate the collection and delivery of the assembled solution from Hyderabad to AV Cell in Atholville
- Assist in finalizing the storage location and access strategy for the collected data.

5. Deliverables:

- Fully configured imaging system, both hardware and software, which meets the demands detailed in Section 3 “Scope of Works”, detailed above.
- Regular ISO 5350 – 2 structured reports regarding the Dirt Contamination levels identified.
- Regular reports regarding the Whiteness of the pulp mat.
- Remote diagnostic capability for the system via the Edge PC.
- Configuration diagrams and technical documentation for the delivered system.

6. Internal Risk of Project Deployment Delay

- Unexpected delays to hardware delivery.
- Unexpected additional hardware requirements identified at the time of system configuration.
- Unexpected delays in software fulfillment.

7. External Risk of Project Deployment Delay

- Delay in delivery of system from Hyderabad to Atholville due to customs clearance or freight issues encountered either in India or in Canada.
- Delays in sourcing and installing the components to be supplied locally, as detailed in Section 4 “Scope of Work” above.
- Delays in assembling and installing the supplied components in their correct positions in Atholville when delivered.
- Delays in the provision of full network access through site security.
- Delays in the provision of links through the local Pi network.

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