DETAILED SPECIFICATIONS

Introduction:

The purpose of the system is to maintain continuity of broadcast content transmission in case of a predefined signal failure/error that comes from the 8 studios.

In order to determine the predefined failures/errors, related settings shall be defined by KTV and the Analysis, Alarm and Monitoring System shall be configured accordingly.

The system is expected to perform automatic switching to the Playout System once a predefined failure/error is detected by the Analysis, Alarm and Monitoring System.

The Analysis, Alarm and Monitoring System shall trigger the Video Router which should be deployed as the central signal input/output position, and the switching mechanism shall be carried out by this Video Router.

The Playout system shall continuously and simultaneously run 8 playlists for each studio. Those playlists have the purpose of content continuity in case of a signal loss/error from each of the 8 studios. In which studio signal output loss/error occurs, the video router shall automatically switch to the playout port of that particular studio playlist.

Discrete digital audio is provided from the studios, therefore audio embedding should be performed before all studio signals are introduced to the video router. Video router and audio embedder/de-embedder products should be controlled over the same network management software and it must be installed to a computer that is currently being used in the operational area of KTV.

Equipment Specifications:

1. Playout System

1.1 The playout system hardware must have the following minimum requirements:

- The system must support 3G SD/HD-SDI input and outputs, and Tri-Sync or Back Burst for the reference input.
- System should have 8 x bi-directional 12 bit SD/HD which must be configurable independently as input or output .
- The system should support SD and HD resolutions and 16-channels of embedded audio.
- Video input and output ports should support 525i59.94 NTSC, 625i50 PAL, 720p50, 720p59.94,720p60,1080p23.98, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080p50, 1080p59.94,1080p60,1080PsF23.98, 1080PsF24, 1080PsF25, 1080PsF29.97, 1080PsF30,1080i50, 1080i59.94 and 1080i60 resolutions.
- The monitor that is going to be used along with the proposed system must have support for Full HD 1920x1080 resolution. It must be a minimum 23" Wide LED LCD, 5ms response time and have an native HDMI port.

The playout system software must have the following features:

- Playout software should be able to run by itself from its own interface and it also should be capable of running from server-client side, if needed
- Must be able to play video files prepared in NTSC or PAL standards. SD, HD, 2K, 4K, 8K resolutions; Avi, Mpeg2, MP4, Mov, MXF, Apple ProRes, Apple DVCPRO, Apple XDCAM, Apple DV50 and Apple DV formats should be able to play on

the same Playlist in real time directly, without waiting and without conversion.

- There should be a separate playlist window on the software that can be switched automatically, by giving it time, if desired. This window should be able to be scheduled as well as be timed and should be able to play the list that is on itself by automatically interrupting the main broadcast on certain days and times of the week. When the list ends, it should be able to continue broadcasting from the point where it left the main list.
- There should be a CG engine integrated into the software. Through this CG engine, all of the normal CG operations should be able to overlay CG objects on the playout software either while reading in the file or while outputting the live input to the output. These operations are in real time and CG changes should also be made in real time and sent to the output manually.
- Playout software should be capable of being added to the playlist in different ways in order to provide automatic entry and exit of CGs. In this way, at any instance of the file, CG templates and contents should be automatically placed according to the database or according to the file name.
- Within the software, an unlimited number of events should be assignable to the clips in the playlist. CG templates, GPI triggers, L band templates, DTMF triggers should all be addable to these events. In this way, multiple and different combinations of triggers should be addable in a single file. For these added events, the duration of the clip should be adjustable.
- Events must be capable of being added between the clips in the playlist, these events being Stop, Stop + CueNext, Wait, Live, CGShow, CGClear, L-Band, Audio Mixer Preset, DTMF Tone, DTMF Command, GPI Out and TCP Command. Events should be able to be added without any limit between the desired clips.
- Must be able to switch directly between playlists while on air. Playlists should be able to be copied and reproduced, their

order should be changeable. Similarly the clips in the playlists can be copied and reproduced as well as moved from one playlist to another.

- The colors of the visual materials in the playout software should be changeable according to user preference.
- Field and frame settings must be selectable in software.
- Should be able to play SD, HD, 2K, 4K, 8K images simultaneously, 44Khz sounds should be able to automatically upscale to 48 Khz. It should be able to automatically perform real-time frame rate conversion, audio sample rate conversion, resolution up and down conversion. It should be able to play videos in different frame rate, audio sample rate, resolution and codec in the playlist in real time and output in the desired output format.
- Must have an internal router to change the location of the sounds at the output, so that the desired audio channel can be given to the desired output from the embedded audio output.
- While editing the videos in the trim window in the software, the videos should be saved and processed directly on the playlist without being taken back to the list.
- The clips on the playlist should be able to be broadcasted quickly and easily on the desired second or minute.
- Categories should be created on the playout software and these categories should be assigned to videos.
- The sound and image quality of the videos should be controlled via playout software.
- There should be a search tab where videos and playlists in the playout software can be searched.
- System features and usage should be controllable by the software.
- Should be able to output SDI, NDI and Medialink simultaneously.
- Must support SD, HD, 2K, 4K and 8K resolutions on SDI, NDI and Medialink outputs.
- Must have support for 525i59.94 NTSC, 625i50 PAL, 720p50, 720p59.94, 720p60, 1080p23.98, 1080p24, 1080p25,

1080p29.97, 1080p30, 1080p47.95, 1080p48, 1080p50, 1080p59.94, 1080p60, 1080p95.90, 1080p96, 1080p100, 1080p119.88, 1080p120, 1080PsF23.98, 1080PsF24, 1080PsF25, 1080PsF29.97, 1080PsF30, 1080i50, 1080i59.94, 1080i60, 2Kp23.98 DCI, 2Kp24 DCI, 2Kp25 DCI, 2Kp29.97 DCI, 2Kp30 DCI, 2Kp47.95 DCI, 2Kp48 DCI, 2Kp50 DCI, 2Kp59.94 DCI, 2Kp60 DCI, 2Kp95.90 DCI,2Kp96 DCI,2Kp100 DCI,2Kp119.88 DCI,2Kp120 DCI, KPsF23.98 DCI, 2KPsF24 DCI, 2KPsF25 DCI, 2KPsF29.97 DCI, 2KPsF30 DCI, 2160p23.98, 2160p24, 2160p25, 2160p29.97, 2160p30, 2160p47.95, 2160p48, 2160p50, 2160p59.94, 2160p60, 2160p95.90, 2160p96, 2160p100, 2160p119.88, 2160p120, 4Kp23.98 DCI, 4Kp24 DCI, 4Kp25 DCI, 4Kp29.97 DCI, 4Kp30 DCI, 4Kp47.95 DCI, 4Kp48 DCI, 4Kp50 DCI, 4Kp59.94 DCI, 4Kp60 DCI, 4Kp95.90 DCI, 4Kp96 DCI, 4Kp100 DCI, 4Kp119.88 DCI, 4Kp120 DCI, 4320p23.98, 4320p24, 4320p25, 4320p29.97, 4320p30, 4320p47.95, 4320p48, 4320p50, 4320p59.94, 4320p60, 8Kp23.98 DCI, 8Kp24 DCI, 8Kp25 DCI, 8Kp29.97 DCI, 8Kp30 DCI, 8Kp47.95 DCI, 8Kp48 DCI, 8Kp50 DCI, 8Kp59.94 DCI, 8Kp60 DCI resolutions at the output of the SDI.

- Playout software must support up to 64 channels of embedded audio output on SDI output. Playout software must support up to 16 channels of embedded audio output on NDI and Medialink outputs.
- Software should support subtitle and closed caption features.
- It should be able to record in MPEG2 TS, MPEG2 PS, MPEG4, AVI and MXF formats via playout software.
- Must support H264, H264nv, H265 and H265nv codecs.
- Must support UDP, RTMP, RTMPS and SRT protocols.
- The resolution and bitrate value through the playout software should be able to be adjusted differently from the playout output.
- The time counters in the software should be able to be openable when desired and brought to the desired size in any part of the screen.

- Must have 16 live inputs that can be used if required.
- There should be a sound compressor feature on the playout software.
- The audio mixer on the software must support up to 64 audio outputs. The audio channels must be routable.
- Should be able to be commanded by external devices using GPI triggering.
- Playout software must be password protected.
- The RAM memory time values of the videos to be played should be changeable when desired.
- The number of videos to be taken into the que should be changeable.
- All components and peripherals of the playout system shall be delivered ready for broadcast.
- Components, installation, usage, measurement-maintenance, repair manuals and books, etc. along with all the relevant documents shall be delivered with the system.
- Playout software will be delivered with all operating system and application software, licenses and installation CD/DVDs.
- The software should be designed independently from the hardware in order to ensure that the operation and development processes such as updating, development, renewal of the hardware of the playout system are of low cost and can be carried out smoothly.
- Licensing method(s) must also be independent from the hardware and key coded.
- All accessories (cables, connectors, converters, etc.) required for the playout system to fulfill all the functions expected from it will be provided by the company.
- Health Monitoring and Alerts: Channel Status Checks: Regularly verify the health of each live channel. Is the stream active? Is the video frozen or black?
- Thresholds: Set thresholds for detecting issues. If video freezes, goes black, or audio drops for longer than the threshold it triggers an alert.

- Frame Analysis: Continuously analyze video frames. Detect sudden black screens or frozen frames.
- Audio Waveform Analysis: Monitor audio levels. If there's silence for too long, raise the alarm.
- Detect lip-sync delay: Detect lip sync when a person is speaking and the audio is delayed
- Stream Latency: Keep an eye on stream delay. Sudden spikes could indicate issues.
- Network Latency: Monitor network latency between encoder and server. High latency might cause problems
- Backup Streams: Set up multiple more (up to 3) backup streams for each channel.
- Framerate Monitoring: Ensure consistent framerate. Drastic drops could signal issues.
- Resolution Checks: Return to the original resolution if the up or down convert disconnected
- Detailed Logs: Keep logs of channel events—start, stop, errors, etc.
- Diagnostic Tools: Provide tools to analyze historical data. Was yesterday's blackout due to a specific error or network issue?
- Integration with Existing Systems: Connect to our current Magnum and Router.
- Configurable Alerts: Let users customize alert sound and timeframe
- Clear Indicators: Make it easy to spot problematic channels immediately
- Simulate Errors: Test the system by intentionally freezing a channel or muting audio. Ensure alerts trigger correctly
- Scheduled Tests: Regularly simulate issues during off-peak hours. (1 minute per day

1.2 The playout remote control system must have the following minimum requirements:

- Should be able to remotely control the Playout System, compatible with the system using the IP address. The software must be able to be controlled remotely and should be addable to the system by setting the IP and port information and the software added to the system should be named by the user.
- The software used to remotely control the system should be able to display the status information of all compatible devices on the same interface.
- Must have the ability to work as Master, Slave and Mirror. Devices working with these features should be able to work synchronously. The user should be able to configure which of the added software will match via the user interface.
- Must have video router feature. Video mixer and video matrix devices must be triggerable by the software.
- The software used to remotely control the system should have the ability to activate the backup device in case one of the compatible devices in the network has a problem by using the n + 1 backup feature. After the backup device is activated and after the defective device is repaired, the lists in the backup should be automatically transferred to the main machine and the backup should be switched back to the empty state. The starting point of the file will be determined by summing the time elapsed and the time spent during this process. In this way, the broadcast flow and timing should not change.
- Should be able to send the stream (video transmission) over two different IPs using the IP switcher feature. Also, it should be able to control multiple systems simultaneously with the Multicontrol feature.
- Able to play CG (character generator) template files over the playout system via LAN or WAN.
- Able to parse the file paths to be used in the broadcast and convert the data on this path on the clip into content for CG templates.
- Needs to be able to update text, image or video content for CGs in Live mode.

- Software being used should be able to start multiple CG (character generator) systems with different templates simultaneously with the Multicontrol feature.
- The broadcast automation control software must have optional MOS 2.8.4 support. In this way, it should be able to work integrated with NRCS systems.
- Must have native support SCTE35. Playlists and Encoder should be triggered on Playout with the information received via SCTE35.
- The software should be able to be protected with user name and password if required.
- Must able be able to be locked if desired. When the software is locked, all previews should be possible but user operations should be prevented.
- Software should be able to create As Run Log with user-specified filters.
- Needs to be able to record all of the desired logs of the operations and user transactions.
- Should have a category feature. Using the category feature, CG should be automatically added to the videos playing or scheduled to be played. The added CG video, image and text objects should also be able to change automatically by associating them with the video.
- Must have random playback feature using the category feature.
- Playouts added on the software must have the ability to control up to four Playouts on a single screen.
- Needs the ability to control up to twenty Ingest added on the software on a single screen. The Ingest software being controlled should be able to show preview screens with NDI feature. The resolution of the preview screens to be displayed should be determinable by the user.
- Must be able to send warning mails by the mail server that is to be added. Warning mails should include warnings of disconnection, making a new login, adding a new software and

activation of the backup software. Different warnings should be selected for each mail address to be added.

- Needs to have GPI triggering support. Which action will be triggered on which channel via GPI must be adjustable by the user.
- Should be able to work with DTMF commands. Incoming DTMF commands and which action the incoming command will trigger on which channel should be adjustable by the user.
- There should be an archive and media asset management system integrated with the software and it should work integrated with this archive and media asset system.
- The system should have redundant power supply.
- Backup Streams: Set up multiple, up to 3, backup streams for each channel.

2. Analysis, Alarm and Monitoring System

2.1 The analysis and multiviewer system hardware must have the following minimum requirements:

- The processor in the proposed system must Turbo Boost Technology and Hyper-Threading Technology.
- OS drive must be a 480 GB SSD RAID1 mirrored disk that will run at least 1 operating system with a transfer speed of 500 MB / s.
- Media drive must be at least 2TB RAID5 SSD with a 500 MB/s transfer rate.
- Built-in RAID support on the proposed system and Raid 0,1,5,10 should be available if desired.
- 2 x 10Gbps network interface installed as stream and data transfer IO.
- 1 x 1 Gbps network interface installed for management interface
- A redundant gold-certificated power supply with a minimum power of 550W.

- The proposed system should have a reserved monitor port to be used for system management.

2.2 The analysis and multiviewer system software must have the following features:

- **Input Source Standards:**
  - Support multiple formats SD, HD, 2K, 4K, 8K as input sources.
  - Support both scan types of Progressive and Interlaced stream.
  - Compatible with both NTSC and PAL standards.
  - Video Sampling 4:2:2, 4:4:4 as input sources.
  - Multiple Rate switchable SDI video input.
- **Network Sources:**
  - Monitoring and analyzing MPTS incoming sources in multiple formats.
  - Monitoring and analyzing SPTS incoming sources in multiple formats.
  - Support monitoring and analyzing UDP, RTP, RTSP, and HLS incoming sources in multiple formats.
  - Support monitoring and analyzing RTMP incoming sources in multiple formats.
- **Video Card Sources:**
  - Support monitoring and analyzing SDI (up to 12G) and HDMI sources with compatible video cards.
  - Multi-viewer software should support SDI and HDMI input with embedded Audio up to 64 channels.
- **DVB-S2 Sources:**
  - Support monitoring and analyzing DVB-S2 8PSK, and QPSK sources and automatically detect and re-sync the service format.
- **ASI Sources:**
  - Support monitoring and analyzing ASI sources in multiple formats.
- **NDI Sources:**

    - Support monitoring and analyzing NDI sources in multiple formats.
- **FM Sources:**
    - Support monitoring, analyzing, and recording of FM sources.
- **SNMP Sources:**
    - Support monitoring, analyzing, and logging of SNMP sources.

- **Key Features:**
    - Support both video decoding at CPU decoding and GPU decoding for stream decoding.
    - Ability to dump any desired incoming stream into a file with a custom file name, path, and split mode.
    - Automatically reconnect to the signal when the signal is received in case of signal interruptions.
    - Receive, monitor, record and alarm only audio signals for radio broadcast monitoring purposes.
    - Able to use authentication with username and password.
    - Authentication feature for interface logins or control outputs and inputs. Users could control each input source or output with authorization.
    - Should show users only authorized inputs and authorized outputs.
- **Connectivity and Management:**
    - Remote management available as a web interface.
    - Management interface available in Windows form.
    - Mobile application, to provide easy control of the sources and view
    - Provide an API to support third-party applications.
- **Sources and TS Parser:**
    - Provide a list of all basic streams and services detected in the transport stream and the status of all compliance and template tests.

    - Option to decode the first program of the MPTS stream.
    - Option to enable/disable deinterlace for each source.
    - Option to select the source preview tile as automatic or manual.
    - Support multiple network interfaces with an option to select the stream input interface from the available network interface.
    - Support multiple GPU devices for decode purposes. Users could select which stream will be decoded on which GPU device from the GUI.
- **Mosaic Output Types and Formats:**
    - Support simultaneous HDMI and DVI mosaic monitoring output in both HD, 2K, 4K, and 8K formats.
    - Support simultaneous NDI mosaic monitoring output in both HD, 2K, 4K formats.
    - Support a combination of HD, 2K, 4K and 8K sources and monitor them all simultaneously on a single or multiple mosaic monitors.
- **Mosaic Output Control:**
    - Support multiple simultaneous HDMI, DVI and NDI output in both HD, 2K, 4K and 8K formats.
    - Dedicated preview control panel for each graphic output with ability to control the graphic output ports separately.
    - Dedicated preview control panel for the NDI output with ability to control each graphic output port separately.
    - Ability to take a snapshot of selected preview output and save it to an editable location path.
    - Output control panel layout must be the same as the actual preview with context menu each for each index.
    - Output control panel layout must have a list of available preview output panel with ability to switch between them.
    - Output control must have an option to show the source log for each tile.
    - Output control must have an option to stop the source preview for each tile.

    - Output control must have an option to assign a source manually to each tile.
    - Output control must have an option to stop the alarm for each index.
    - Provide custom outputs, each output assigned to a user and each user can control their own sources and mosaic outputs via tablets
- **Layout Designer:**
    - Provide operator with mosaic layout designer and editing tool to create custom layouts.
    - Equipped with layout template library to Load, save and delete layout files.
    - Fixable mosaic layout with customizable title settings include font, channel name, logo, colors, opacity for each tile.
    - Ability to preview the selected tile in full screen mode and with audio preview.
    - Support customizable Round-Robin pages feature which allows changing of configurations in dynamical loop mode according to the time in playlist.
    - Provide operator with Round-Robin playlist builder.
    - Clear indicators to spot problems and errors easily

- **On-screen Graphics Elements:**
    - Support adding and displaying analog or digital clocks with custom time zone offset for each tile in the mosaic monitoring output.
    - Support adding and displaying image files for each tile in the mosaic monitoring output.
- **VU-Meter:**
    - Support eight audio channels.
    - On/off toggle option for VU-Meter overlay.
    - Show/hide option for VU-Meter level.
    - Display more than one audio stream under a program.
    - Audio outputs could be selected by shortcuts.

2.3 Professional Video Display

Professional grade non-glare displays shall be used for multiviewer outputs with the minimum requirements below:

- Must support 24/7 operation
- 2 x HDMI inputs
- Panel Diagonal Size : 55"
- Resolution : 3,840 x 2,160
- Brightness : 500 cd/㎡
- Viewing Angle : 178 / 178° (H/V)
- Contrast Ratio : 4,000:1
- Max Response Time : 8ms
- Monitors should be supplied and installed with their wall mount kits.

2.4 2 x 3G-SDI to HDMI converters shall be provided for each display that one of them shall be for shelf spare. Converters must support all SMPTE signals for 3G/HD/SD SDI signals with embedded audio.

2.5 2-way Professional Near Field Audio Monitor (Pair)

- Low Frequency Amp : 60 W
- High Frequency Amp : 40 W
- Inputs : 1 x XLR 3-pin female (balanced)
- Frequency Response : 52Hz to 35kHz
- Maximum SPL : 110 dB
- Input Impedance : 10k Ω balanced, 20k Ω unbalanced
- The placement of the speakers shall be done with the necessary mounting apparatus.
- 1 x 1RU monitor controller with rotary potentiometer on the front panel shall be supplied for audio output level adjustment.

2.6 Monitoring and Alarming:

- Automatic video FAULT DETECTION AND ALARMS such as Frozen picture, Black picture and Loss of video.
- Automatic signal FAULT DETECTION AND ALARMS when the signal is lost.
- Automatic service FAULT DETECTION AND ALARMS when the service is down.
- Automatic Audio FAULT DETECTION AND ALARMS such as Audio loudness and Audio Silence.
- Automatic FM signal level FAULT DETECTION AND ALARMS.
- Support SNMP trap messages with configurable interface and port.
- Monitor and alarm at the error beginning and ending points
- Detect lip sync errors
- Detect framerate change
- Detect resolution change
- Detect change in audio waveform

- **Audio Alarm Notification:**
  - Automatic audio notification for the operator when detecting alarms.
  - Customizable audio alarm file settings.
- **Visual Alarm Notifications:**
  - Support a penalty box (or quarantine zone) that allows the settings of a red outline for each tile in the mosaic monitoring output displaying services with errors.
  - Automatic visualization on the mosaic monitoring output where alarms for services are displayed when they happen.

- **Emergency Sound and Light Alarm Device:**
    - The device shall be triggered and activated by the Analysis, Alarm and Monitoring System in case of a predefined signal failure/error that comes from any studio.
    - The device should be wall-mounted and provides sound and flashing light alarm as audible and visual warning.
    - The device should have high-quality alloy speakers and steel material.
    - The sound alarm volume can be adjusted, and the sound alarm tone can be selectable by the user.
    - The flashing visual alarm is provided in the form of LED strobe light in red color with light diffuser by the same device.
    - The device should have the minimum dimensions of 32 x 16 x 19 cm.
    - The device should provide minimum 24W power and 115dB sound level.
    - The Alram system will be installed in the MCR and in studios.
- **Mailing and Events log:**
    - Configurable mailing list module.
    - Software operator must be able to access the mailing list within the alarm settings section to build custom receiver lists for each alarm category with intervals and time to send options.
    - An email notification when it detects alarms.
    - Write the errors it catches to the log file when detecting an alarm.
    - Write the errors it catches to the log file when detecting an alarm.
    - Provide an SNMP Logging tool with adjustable log interval and a25ging rule.
    - Simulating errors to check system health
    - Scheduled simulating errors for regular system health checking
    - Diagnostic tools to help understand every error that occurs.

3 . Video Router

3.1 32 x 32 Video Router

- Minimum 32 video inputs and 32 video outputs.
- Video input connectors and video output connectors shall be BNC, HD BNC or DIN connectors.
- It must have external video reference input and accept PAL composite or tri-level sync signals as reference. It must also have 1 looping for its reference input.
- Video inputs and outputs shall comply with SMPTE 259M-C SD SDI, SMPTE 292M and SMPTE 424 M SDI interface standards.
- It switches SDI video signals conforming to SMPTE 259M-C SD SDI, SMPTE 292M and SMPTE 424M standards and is able to transmit embedded audio on these signals without distortion.
- “Automatic cable equalization” feature for all video inputs.
- Upgradable with a software license to enable the data rates up to 12Gb/s. In case there is no such an upgrade path for the future, the video router system must be offered with ST 2082-1:2015 12 Gb/s Signal/Data Serial Interface support.
- Once it is upgrade to ST 2082-1:2015 12 Gb/s, the system shall support the ability to perform Quad Link 2SI to single link 12G UHD, and 12G UHD to Quad Link 2SI conversions .
- Able to provide different formats with no manual reconfiguration of the ports.
    - SD and HD
    - 576i/720p/1080i/1080p/2160p
- It must support 16 channels embedded AES audio per video channel.
- Performs video clean switching and audio quiet switching on every output.

- It switches and transmits audio signals that are DolbyE or Dolby AC-3 encoded and embedded on the SDI signal without breaking the DolbyE and Dolby AC-3 structure.
- It must be offered with a redundant power supply so that in case of any failure in the main power supply, it should perform automatic switching to the redundant power supply with no need to turn off the router when replacing the defective module.
- All crosspoint connections shall be automatically made by the router system before the video router system is turned off and on again.
- Able to interface with 3rd party automation systems and other routing systems.
- It supports salvos. Creation, editing or assigning salvos to control clients shall not interrupt operations.
- It allows addition of minimum 2 multiviewers with software licensing for future use. It should not be done by special I/O boards or crosspoints different from the base router.
- It must support multiple IP addresses for client connections.
- It must report signal type and presence on inputs.
- The software required for programming the video router system and the control panels shall be given to the administration together with their licenses.
- Control panels will be 19 inches wide.
- The following types of router control panels working together with the video router device shall be offered.
-
    - 3.2 1 x XY Control Panel
        - It allows to instantly direct one of the signals connected to the video inputs of the video router to the desired video output.
        - Minimum 18 re-legendable LCD/OLED backlit buttons that can be assigned as source, destination, category, breakaway, salvo and lock.

- If it is assigned as a source or destination, the relevant source or destination names shall be visible on the LCD/OLED buttons.

3.3 1 x Advanced Touchscreen Monitoring and System Control Panel

- 2 RU 19” rack-mountable metal enclosured remote control panel with touch functionality which is ideal for multiple device control.
- Ergonomic design with excellent tactile feel and responsiveness
- High resolution LCD touchscreen.
- Custom layouts and soft panels can be generated via seamless integration with its network management system for configuration and monitoring.
- Realtime controls and alarming of video router and signal processing equipment like embedders.
- Redundant power supply
- Integrated audio speakers
- 1 x GbE Ethernet port and 1 x USB connectivity

4 Glue Equipment

4.1 AES / EBU Audio Embedder

Modular type audio embedders must be supplied within their frame as per the following requirements:

- It performs embedding up to 16 audio channels into a 3G / HD / SD SDI video signal.
- Video inputs and outputs shall comply with SMPTE 259M-C SD SDI, SMPTE 292M and SMPTE 424 M SDI interface standards.
- It must detect input video format automatically.
- It supports delay, gain and sample rate conversion functions.

- The audio delay feature should enable adjusting the delay of the audio channel up to 1000 milliseconds.
- It should provide internal test patterns and tones.
- It should have a silence detection feature, and video output should be programmable in case SDI input is lost.
- The video and audio ports should comply with the specifications below:
    - SDI Input:
        - 1 x SDI (SMPTE 292M, SMPTE 259M, SMPTE 424M)
        - Impedance: 75 ohm
        - Return Loss: >15dB up to 3GHz
    - SDI Output:
        - 1 x SDI (SMPTE 292M, SMPTE 259M, SMPTE 424M)
        - Impedance: 75 ohm
        - Return Loss: >8dB up to 3GHz
    - AES Inputs:
        - Number of Inputs: 8 (AES-3id)
        - Impedance: 110 ohm
        - Sampling Rate: up to 96KHz

4.2 Analog Audio De-Embedder

Modular type audio de-embedder must be supplied within their frame as per the following requirements:

- It performs de-embedding 4 analog audio channels from a 3G / HD / SD SDI video signal.
- Video inputs and outputs shall comply with SMPTE 259M-C SD SDI, SMPTE 292M and SMPTE 424 M SDI interface standards.
- It supports delay, gain and invert functions.
- The audio delay feature should enable adjusting the delay of the audio channel up to 1000 milliseconds.
- It should provide internal test patterns and tones.

- It should have a silence detection feature.
- The video and audio ports should comply with the specifications below:
    - SDI Input:
        - 1 x SDI (SMPTE 292M, SMPTE 259M, SMPTE 424M)
        - Impedance: 75 ohm
        - Return Loss: >10dB up to 3GHz
    - SDI Output:
        - 1 x SDI (SMPTE 292M, SMPTE 259M, SMPTE 424M)
        - Impedance: 75 ohm
        - Return Loss: >10dB up to 3GHz
    - Analog Audio Outputs:
        - Number of Outputs: 4
        - Signal to Noise Ratio -90dB
        - Output Level + 27dBu

4.3 19” Modular Rack Frame and Network Management Software

- The frame must have a hot swappable control card.
- The frame must have front loading, hot swappable power supplies.
- The frame must have a hot swappable, variable speed fan assembly for cooling.
- The frame controller must support a configuration backup of the setup and current parametric settings of the individual modules that can be stored within the frame.
- The frame configuration (network management) software for remote control, monitoring and alarm reporting must support Windows, Mac OS and Linux operating systems, and allow users to configure, control and monitor the frames and modules. It automatically discovers compatible frames and devices.

5. Other equipment

- 5.1 All video input and output signals of the video router system shall pass over the video patch panel. The video jack fields to be used will be 1RU, 24/26 double rows, not requiring U-Link style transitions. It must comply with the SMPTE 424M standard. The signal cuts off when a patch cord is attached to the input or output. 8 pcs of video patch cords shall be supplied along with the patch panels.
- 5.2 Other equipment and glues to fix the system not written should be provided to complete the solution .

6. Services

6.1 Installation & Commissioning & Integration should be provided by the integrator .

6.2 Trainings should be provided free of charge for 10 engineers for 9 days on the site of the project .

7.Bill OF QUANTITY

#	item	Qty	Unit price	total
1	Video Playout System			
1.1	Video Playout Server	1		
1.2	Playout Control Serve	1		
2	Analysis, Alarm and Monitoring System			
2.1	Analysis, Alarm and Monitoring Server	1		
2.2	Video Router Control License	1		
2.3	55" Professional Display	2		
2.4	SDI to HDMI Converter	4		
2.5	Near Field Audio Monitor (Pair)	1		
2.6	Emergency Sound and Light Alarm Device	1		
3	Video Router System			
3.1	32x32 Video Router	1		
3.2	XY Control Panel	1		
3.3	Advanced Touchscreen Control Panel	1		
4	Glue Equipment			
4.1	AES / EBU Audio Embedder	8		
4.2	Analog Audio De-Embedder	1		
4.3	19" Modular Rack Frame	1		
5	Other Equipment			
5.1	Video Patch Panel	2		
5.2	Network Switch	1		
5.3	Installation Equipment (lot	1		
6	Services			
6.1	Installation & Commissioning & Integration (lot)	1		
Total Price				