

TV – Repack Implementation Planning

April 23, 2017

GatesAir Connect @ NAB Show 2017

GatesAir's



Martyn Horspool Product Manager, TV Transmission



Connecting What's Next

TV - Repack Implementation Planning

Martyn Horspool Product Manager, TV Transmission



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Transport

Topics

- Planning for Repack
- Importance of site surveys what to look for
- Identifying items affected by Spectrum Repack in your RF plant
- Staying on the air during the transition
- Summary of site survey and findings at KBJR-KDLH, Duluth, MN





Planning for Repack

- Be prepared save time later!
- Site surveys done now can reveal potential issues and prevent delays later, when time is critical
- A repack transition plan will prove valuable!
- It's not too late to start now







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The Transmitter Site

- Identifying the items that must be replaced often a big headache
- Most sites already have been retrofitted from analog to digital and may not be in the best shape now
- Buildings vary a lot
- Transmitter, RF systems and other items also vary considerably



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The Transmitter Site



Site surveys will help to provide an understanding of the situation today and help to provide a solution for repack





Items to check

- ✓ Location
- ✓ Site Access
- ✓ Roads
- Environment
- ✓ Weather
- ✓ Site Condition
- ✓ Community
- ✓ Restaurants
- Lodging

A thorough look at the tx building is *critical*. Factors to examine include the access roads, moving equipment in and out. Note the challenges, available space, where do we secure equipment like transmission line?

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Tall Building Transmitter Sites



Some sites may be quite challenging:

- Tall buildings
- Remote locations
- Mountain tops
- Presenting numerous challenges. such as:
 - Accessibility
 - Cooling system
 - Local/City codes.....





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Site Hazards





 Other challenges and hazards at the site should be duly noted in the site survey...

Does this thing bite?



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Building & Site Inspection



Building:



- Space availability
- Does the old equipment need to How is the existing equipment be removed first?

Drawings, or sketches, of the existing site should be made to indicate where things are currently located.

Often, issues not shown on a drawing or sketch are found. Example: an area that builds up excess heat during the summer months due to trapped air or poor air flow.

- Building materials
- Can the wall /ceilings support the new equipment?
- mounted?



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HVAC System





- Changes in transmitter size, design, power & efficiency will effect the HVAC system requirements
- Review existing HVAC system find out if it is sized to handle the new equipment
- Old, inefficient HVAC systems generally should be replaced
- Waste heat can also be used heat the building in the Winter season, reducing heating costs considerably



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"Brazed Plate" Heat Exchanger

An inexpensive way to utilize transmitter waste heat to warm the building

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Electrical Plant

needs to be evaluated carefully





Inspection of the existing electrical service is very important

Is the service to the building sufficient for the current, plus the

The size and capacity of any existing UPS, AVR or Generator

- Existing service may be 480V
- Newer transmitter systems new equipment? What might change from a electrical demand? often operate at 208-240V or 380-415V, do you need a transformer?

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Grounding Inspection





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- Grounding is key for safety and equipment protection
- This includes the electrical safety ground and also the station ground system for the tower, transmitter, transmission line, etc.

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Existing RF System





- RF system Floor, or ceiling mounted?
- Is the current system re-tunable to the new channel, or is it channel-specific?



- Are you co-located and channel combined?
- How is a channel change going to effect the other stations?
- Will the other stations affect your system?

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Transmission Line / Tower





- Will the new channel(s) will work with your existing transmission line?
- Will a standby antenna be required during the transition and test phase
- What about the tower? Structural analysis ANSI/TIA-222-G may apply in your state

Create a Plan



- New channel assignments are known
- But questions will be asked:
 - Do I need V-Pol in the future how much?
 - Will I need a rental/loaner transmitter?
 - What are the new electrical demands?
 - What is the size of the new transmitter?
 - Liquid or air-cooled transmitter?
 - What equipment can be re-used?
 - Full turn-key, or project management needed?



[21.02.07]

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Technical Engineering Data Sheets

(A.K.A. TED Sheets)

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1 Sheet provides handy basic data

Most manufacturers can provide data sheets and drawings to aid in planning.

Planning items needed:

- Electrical (consumption)
- Heat load (room)
- Heat to the transmitter cooling system
- Recommended Circuit Breaker sizes
- Size, weight and number of racks
- Pump module size/weight
- Heat exchanger size/weight
- Layout drawings



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Carefully Plan the Transition





 Current equipment placement • The finished project

-RE OUPUT 6-1/8" O RE COAX SWITCH

 Follow-up with as-built, as sometimes plans change

Tomorrow

CORRIDOR

UAXT-8 TRANSMITTE

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PLATINUM TRANSMITTE

CORRIDOR

(J) CP-37

ACCESS-

RF System Layout Drawings





 System layout drawings will be invaluable when placing equipment in room



 RF system layouts specific to your equipment allows your team (or contracted installers) to better utilize the space available in your broadcast plant



Electrical / AC Power Drawings





• Electrical drawings provide information to local trades on breaker & wire sizes and how the electrical connections are made



Plumbing Drawings





 Depending on location and applicable local/city/state codes, it may be possible for the transmitter supplier to install the plumbing, or use a local plumber.



Transmit Radio

Rental & Moveable Transmitter Systems

"Can I rent a transmitter to use while my old transmitter and RF system is being removed?"

- Some manufacturers may be able to provide a rental transmitter
- Typical systems 2kW up to 10kW
- Air-cooled is better for short term operation but liquid-cooled is possible
- Trailer tx solution can be moved site to site during repack





Trailer - Transmitter

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Coverage Analysis



- Changing channel, antenna type and mounting and tower changes could affect your pattern
- An option to consider:
 - Ahead of time, or
 - During testing phase, or
 - After repack for verification



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Site Survey at KBJR-KDLH, Duluth, MN

This section courtesy Quincy Newspapers, Inc.



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95 YEARS GATES AIR

NA/BSHOW

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KBJR / KDLH Site Survey



Comprehensive 232 page report, includes:

- 1. Current Transmitters Installed at the Facility
- 2. Survey of RF Systems
- 3. Internal and External Feedline Identification
- 4. Electrical Considerations
- 5. HVAC Capabilities
- 6. Tower Structural Analysis
- 7. Site and Building Layout

TOWER MAPPING REPORT Site Name: KB/R-KDLE Site *: N/A							
		N.4. D.	ETAIL PA	CT.	_	_	
ANTENNA SUMMARY	ANTEN	NA D	E TAIL PA	GE			
NUMBER	31 OF	40			[
HEIGHT (ANTENNA CENTER HEIGHT MEASUREMENT UNLESS OTHERWISE NOTED)	651'4" Base				- No. Y		
QTY/ MANUFACTURER/ TYPE/MODEL/SIZE	1 QTY Whip 20'Tx2.50"Dia.						
TMA QTY/SIZE	N/A		-				
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MOUNT INF	ORMATION				*		
HEIGHT (MOUNT BASE HEIGHT MEASUREMENT UNLESS OTHERWISE NOTED)	651'4"/651'1"				ł		
TYPE AND MEMBER INFORMATION	1'5"Lx1'2"Tsa/1'8"Tp 2"x2"x.22"/2.38"Dia.P						
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Current Tx Room Summary

- 4 Transmitters on site:
 - KBJR Ch19 1-Tube Std. IOT @ 26kW (480V)
 - KDLH Ch33 1-Tube Std. IOT @ 25.8kW (480V)
 - 5kW Solid State back up tx
 - 44kW Analog Tx (not in service)
- Determined due to obsolescence and other factors, both KBJR and KDLH systems will need to be replaced with new (Solid State) systems





Some Images From Tower Mapping Report





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Summary



Transmitter Building

- Both IOT transmitters will be replaced with new Solid State
- This site has the space, electrical capacity and HVAC to support the new equipment
- New equipment can be quoted, along with needed support services, drawings, details, etc.
- Tower Analysis Results
 - The tower does not have sufficient capacity to carry the existing loads, per ANSI/TIA-222-G. One diagonal at 118.3% of maximum load
 - The following will require modifications:
 - Tower diagonals from 130-ft to 160-ft and 175-ft to 220-ft
 - Tower diagonal connections from 17.5-ft to 40-ft
 - If changes are made to the antennas (likely), the tower analysis will need to be adjusted

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Connecting What's Next

Thank You!

Martyn Horspool Product Manager, TV Transmission



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