FM IBOC COST PLANNING

Richard J. Fry

As the possibility of FCC authorization of IBOC draws closer, many broadcasters are considering the costs needed to add IBOC to their present analog FM service. Some of those basic cost elements are difficult to estimate because the final standard for FM IBOC is still in the proof and acceptance phase at this point. Costs for some of the needed hardware components will remain somewhat fluid until the final design requirements are available. Still it would be useful to know approximately what those final costs might be.

The following template identifies some of the major components needed when adding IBOC to a Class B FM station. The main variations in hardware approach are shown across the horizontal axis, and the cost elements are shown on the vertical axis. The costs are estimates based on the writer's inputs from representative manufacturers of IBOC transmission equipment meeting the expected standard. Widely variable cost elements have been left open for stations to enter an estimate based on their local situation.

Inspection of this template shows that either form of IBOC using separate amplification is less expensive for these particular assumptions. This is the direct result of the high cost of a transmitter capable of common amplification at this power level.

The cost difference between common and separate amplification would be much less for a typical Class A station, and for some power levels may even favor common amplification. Even at Class B power levels, the costs would be closer if the analog FM transmitter had to be purchased (the template assumes using the station's existing analog transmitter and exciter for FM/IBOC hybrid operation).

The need for the IBOC mask filter is dependent on the spectrum performance of the IBOC transmitter installed. Some IBOC transmitters may meet the FCC mask internally, and the external filter will not be needed. This will save the cost and installation space needed for the external filter, as well as reduce the power output requirements of the IBOC transmitter by about 10%.

There could be circumstances where the apparent higher cost of using common amplification even for Class B and C stations could be offset by other factors. Each station will have to choose a configuration based on their own operation.

Note in the "Separate Ampl" columns of the cost template that the operating costs for the analog transmitter need to be added to the costs for the digital hardware format selected (filter or no filter) to arrive at the total cost. Note also that there are other elements of the overall cost over time such as equipment depreciation, true residual value and others that have not been considered here.

FM IBOC COST TEMPLATE

CLASS B FM STATION

(1,000s of Dollars)

	SYSTEM CONFIGURATION (NOTE)				
	COMMON AMPL		SEPARATE AMPL		
				Digital	
	No Filter	Filter	**Analog**	No Filter	Filter
Tx Total AC Power Input, kW avg:	36	40	30.8	5.33	6
Tx Total RF Power Output, kW avg:	18	20	20	1.6	1.8
STARTUP COSTS					
Analog Exciter	Existing	Existing	Existing	-	-
IBOC Exciter	30	30	-	30	30
Analog Power Amplifier	-	-	Existing	-	-
IBOC Power Amplifier	-	-	-	50	50
Common Power Amplifier (solid-state)	250	250	-	-	-
High Level RF Combiner & Reject Load	-	-	-	10	10
Exciter RF Combiner	2	2	-	-	-
IBOC Mask Filter	-	15	-	-	15
IBOC Program Link (T1)	10	10	-	10	10
IBOC Audio Processor	6	6	-	6	6
IBOC Digital Demodulator	15	15	-	15	15
Installation Material Allowance	12	20	-	4	12
SUBTOTAL 1	**325**	**348**	**-**	**125**	**148**
Tx Building Modification			-		
Installation & Commissioning			-		
SUBTOTAL 2			-		
ANNUAL OPERATING COSTS AC Power @ 10 cents/kWh					
RF System	31.6	35	27	4.7	5.3
Tx Air Ventilation Cooling	2	2	1.5	0.5	0.5
IBOC Licensing			-		
TOTAL, FIRST YEAR					

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NOTE: For 50kW analog ERP and -20dBc IBOC (average power), using an antenna system with 2.8X net gain.

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