A brief presentation on impact of change in Threshold Values of Bauxite at NALCO's Panchpatmali Bauxite Mine (East Coast Bauxite)

National Aluminium Company Ltd (NALCO)

(A Govt. of India Enterprise)

Set up in the State of Odisha in 1981 as Asia's largest Bauxite- Alumina-Aluminium complex.

Panchpatmali Bauxite Mine of 6.825 MTPY capacity and Alumina Refinery of 2.275 MTPY capacity are located in Damanjodi, Koraput.

Smelter of 4.6 lakh tons capacity and Captive Power plant of 1200 MW capacity are located in Angul.

Port facility at Visakhapatnam, AP.

Panchpatmali Bauxite Mine

- Single largest bauxite capping hill with 310 MT reserves (MECL-1979).
- Belongs to East Coast Bauxite reserves on eastern ghat hills.
- Initial production started in 1986-87 for 2.4 mtpy capacity.
- Present capacity 6.825 mtpy.

- Exploration done on 100m sq. grid using Vacuum Suction drills.
- Pre-production drilling carried out on 25m sq. grid.
- Samples from each meter are collected and analysed for chemical characteristics and entered into a computer for estimation.

- Geo-statistical method is used for Reserve Estimation and Mine Planning purposes since 1983-84.

NALCO's Panchpatmali Bauxite Mine Cut-off (original) :

Bauxite -	**Al2O3%**	**+20%**
	SiO2 (T)%	**- 4%**

IBM suggested Cut-off (2009):

Bauxite -	**Al2O3%**	**+30%**
	SiO2 (R)%	**- 5%**
Aluminous Laterite -Al2O3%		**>20% (min.)**

NALCO's Revised Cut-off from 1st Oct. 2015 :

Bauxite -	**Al2O3%**	**+20%** (in place of +30%)
	SiO2 (T)%	**- 7%** (equivalent of 5% reactive Silica%)
Aluminous Laterite -Al2O3%		**>20%**
	SiO2 (T)%	**> 7%**

Understanding Change of cut-off

+20/-4 Cut-off

SB0128

Al2O3%	SiO2%
42.11	8.25
48.28	9.09
46.91	5.09
43.14	4.78
39.55	7.31
46.75	3.59
42.14	4.70
40.96	3.94
44.79	4.05
46.84	3.75
55.59	1.82
49.04	3.71
47.26	3.92
62.49	3.70
63.48	3.96
60.88	7.96
51.70	27.54
51.01	34.86
49.57	36.68

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+20/-7 Cut-off

Balance Reserve of Panchpatmali on +20/-7 cut-off (as on dt. 31.03.2017)

Mine Lease	Block	Bauxite		
		Tonnage (Mill.T)	Al_2O_3(T) (%)	SiO_2(T) (%)
North Central Block	NB-I	46.74	41.42	4.17
	NB-II	10.56	42.07	3.84
	CB-I	1.33	42.25	3.37
	CB-II	63.31	43.85	3.56
	Total	121.94	42.75	3.82
South Block	SB	82.05	42.37	3.88
Panchpatmali Total	Total	203.99	42.60	3.84

Impact of change in Cut-off during Implementation

Cut-off	Reserve as on 1st Oct. 2015		
	Tonnage (Mill.T)	Al_2O_3(T) (%)	SiO_2(T) (%)
+20%/-7%	214.31	42.57	3.84
+20%/-4%	156.58	42.48	3.21
Additional Bauxite Reserve gained	57.73 mill. tonnes		

By increasing the Thresh hold limit as per IBM's guideline (2009), NALCO's major advantages and dis-advantages are as follows;

Advantages :

1. **Increase in NALCO's Bauxite Reserve by nearly 58 mill. Tonnes leading to increase in Life of Mine for nearly 5-6 years.**

Disadvantages :

1. **Handling of high silica bauxite, leading to Consumption of more Caustic soda in Alumina Refinery, thereby increasing Cost significantly and reducing Profit margin.**
2. **Increase in Sp. Consumption of bauxite as well as reduction in plant production capacity**
3. **Mud settling problems including handling of higher Qty. of Mud.**
4. **Requirement of modification of Plant machineries, thereby increasing the Capital investment .**

Thank You