

Energy Management System: A Holistic Approach for Energy Performance

Indian Rayon (A Unit of Aditya Birla Nuvo Ltd.) Veraval, Gujarat

– Mr. Dashrath Chouksey, Assistant Manager (IMS), Indian Rayon

About the Plant

Indian Rayon (IR), SBU of the Aditya Birla Nuvo Limited, is a leading manufacturer of viscose filament yarn (VFY) with a rich heritage of over 60 years. This yarn is an input to the textile industry for manufacturing fabrics used in apparel and home furnishings. With a turnover of around Rs. 699 crores/annum (FY15), Indian Rayon is a leading VFY exporter with exports to 45 countries, in addition to the lion's share of India's market. IR played a major role in catapulting India to the second position worldwide, as a manufacturer of VFY, with China at first position.

The SBU owns completely integrated operations of capacity 19800 tons/annum, producing Pot Spun Yarn (PSY), Continuous Spun Yarn, (CSY), and the unique, patented Spool Spun Yarn, (SSY) (acquired technology in 2013 for manufacturing and marketing in India from the globally reputed ENKA, Germany). It is backwardly integrated with a 34.5 MW captive power plant and a 250 TPD caustic chlorine plant (part of the Chlor-Alkali SBU). The integrated complex is located in Veraval, Gujarat. Manufacturing and other functions are located at Veraval, and sales and marketing, in Mumbai.

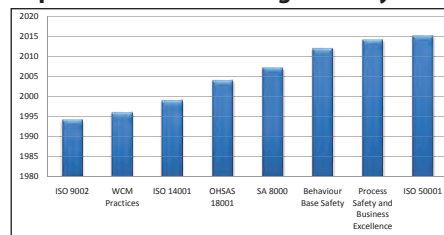
Indian Rayon is unique in many ways:

- It is the only company to use all 3 kinds of technology – customers can choose the VFY required at one location
- It is the first VFY business in India accredited with ISO 9001, ISO 14001 (Environment), ISO 50001 (Energy Management), OHSAS 18001 (Health and Safety), SA 8000, REACH Compliance and OekoTex certification.
- It is the largest VFY exporter from India and recipient of the SRTEPC export awards.
- It is the first company taking a VFY brand to the end consumer that will also benefit the industry as a whole, in India.

Journey towards Excellence

Indian Rayon is a system oriented plant: the journey towards implementing Management Systems was started way back in 1994 by ISO 9002, and from

Figure 1: Indian Rayon's journey towards implementation of Management Systems



1996 onwards, Aditya Birla World Class manufacturing practices (WCM) were initiated. Indian Rayon is accredited with ISO 9001:2008, ISO 14001:2004, OHSAS 18001:2007 and SA 8000:2008 certifications. From 2012, Indian Rayon has been working with DuPont for implementing Behavior Based Safety and Process Safety Management. The ABG WCM framework was upgraded to a Business Excellence framework and implemented from 2014. The business is also working towards improving its energy performance and was certified as ISO 50001:2011 compliant in year 2015.

We have a strong culture of World Class Manufacturing practices involving kaizen, various campaigns, competitions and award schemes. In line with our Group's vision of CSR, Indian Rayon has established the Jan Seva Trust (JST) in the unit, for the cause of Education, Health care, Sustainable Livelihood, Infrastructure Development and Women.

ISO 50001:2011-Implementation at Indian Rayon

In July 2014, the management decided to implement the ISO 50001:2011 Energy Management System to improve its energy performance. A certifying body, DNV, was identified, who could work with the company to implement the system. Since the company had a strong team with two decades of experience in Management Systems, no consultant was engaged for documentation; however, training and certification were within the scope of DNV. With the guidance of

Table 1: Main Products and Manufacturing Capacities

Product	Capacity	Integrated Operation
VFY	54.5 TPD	
Sodium Sulphate	32 TPD	
Sulfuric Acid (H ₂ SO ₄)	100 TPD	
Carbon di Sulfide (CS ₂)	27 TPD	
Power	34.5 MW	
Caustic	250 TPD	



the Unit Head, a core team was formed under the leadership of FH (QA&TS) who was also appointed as Management Representative for ISO 50001:2011. The core team consisted of:

- Function Head (Caustic and Power plant)
- Department Head (Finance and Accounts)
- Department Head (Power Plant) – also Energy Manager
- Department Head (Caustic Plant)
- Department Head (Technical)
- Section Head (Daily Report)
- Section Head (VFY Electrical)

Apart from the core team, an execution team was also formed with members from different sections of the plant. The responsibility of the core team was to review the progress, whereas the execution team was responsible for data collection and documentation.

Implementation plan:

A detailed implantation plan was established by the Management from August 2014 to April 2015 to execute all the activities.

The implementation started from August 2014 by finalizing the certifying body and the first training program was

conducted for team members on 11th October 2014. Thereafter, a two- day internal auditor’s training program was also organized for a team of 20 people during 13th-14th November 2014. The first stage document audit was carried out by DNV during 13th to 14th March 2015. Corrective actions on the first stage audit findings were completed with 15 days. An internal audit was carried out from during 6th - 9th April 2015 and thereafter, a management review was carried out on 11th April 2015. Review of documentation and preparedness for final audit was carried out by DNV from 13th to 14th April 2015 and recommended for final audit which was conducted from 28th to 30th April 2015. After the audit was successfully carried out, certification was recommended for Indian Rayon. Dedication and the involvement of the team made implementation in a short period possible without a consultant.

Action Initiated During Implementation Process:

- Energy manual established as per ISO 50001:2011 requirement
- Energy policy documented and communicated to team
- Procedures such as energy review, energy base line, monitoring and measurement method defined



Awareness Program – 11th Oct’14



Internal Auditor Tr. Program 13-14 Oct’14



Internal awareness program Feb-Mar’15



Management Review – 11th Apr’15



Stage 1 Audit 13th - 14th Apr’15



Final Audit – 28th Apr’15

Table 2: Action Plan for implementing the ISO 50001 Energy Management System

S.No	Activity	Responsibility	Plan	Month												Remarks									
				Aug-14		Sep-14		Oct-14		Nov-14		Dec-14		Jan-15			Feb-15		Mar-15		Apr-15				
				F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2		F1	F2	F1	F2	F1	F2			
1	To get the quotation from various party	D. P. Chouksey	Plan	Actual																					
2	Commercial and technical discussion and negotiations with the party	Sanir Kapoor / D. P. Chouksey	Plan	Actual																					
3	To make the proposal and get the approval from Unit head	D. P. Chouksey	Plan	Actual																					
4	Form a core members team with leader to initiate for the project	Mgmt.	Plan	Actual																					
5	Organize the Implementer course on (ENMS)	D. P. Chouksey	Plan	Actual																					
6	Visit / Energy policy of the organization and review of existing energy condition	Core Team	Plan	Actual																					
7	Plan to visit any ABG unit where ENMS is already implemented to understand their process	A. B. Solitra	Plan	Actual																					
8	Preparation of ENMS Manual, Procedures, Work Instructions, formats etc	Execution Team	Plan	Actual																					
9	Identification, interpretation of all energy oriented legal requirements, preparation of legal register	Execution Team	Plan	Actual																					
10	Review of existing energy condition to identify significant energy uses, find out OPI and Action	Core Team	Plan	Actual																					
11	First Stage review audit (Review of the documents)	By Certifying body	Plan	Actual																					
12	Based on the review and assessment of the existing energy performances, corrective actions to	Core Team	Plan	Actual																					
13	Internal Auditor Training program (2 days)	MR	Plan	Actual																					
14	Internal Audit planning and execution	D. P. Chouksey	Plan	Actual																					
15	Management review	MR	Plan	Actual																					
16	Data analysis after implementation of the documented system	Core Team	Plan	Actual																					
17	Review of all documentation and checking preparedness for Certification audit	By Certifying body	Plan	Actual																					
18	Audit of the implemented system as per the standards	By Certifying body	Plan	Actual																					
19	Issue of certificates	By Certifying body	Plan	Actual																					

Prepared By : D. P. Chouksey

Approved By : A. B. Solitra



- Format for energy monitoring, change in facility, opportunity register, etc., established
- Energy profile, current energy consumptions trend and comparison with past data documented
- Energy review carried out for all the processes
- Significant energy consuming process identified and action plan initiated
- Baselines established for all processes
- Training and awareness down the line on regular basis established.

Annual Energy Consumption Trend

Figure 2: Annual VFY Production (MT)

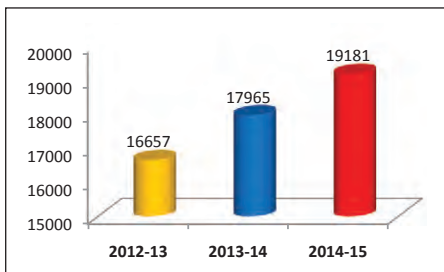


Figure 3: VFY-Power Consumption (Kwh/T of Yarn)

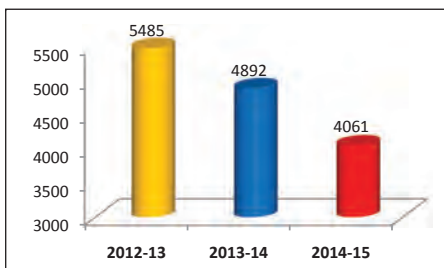


Figure 4: VFY- Steam Consumption (Million Kcal/T of Yarn)

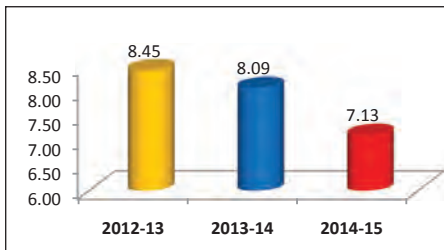


Figure 5: Annual Caustic Production (MT)

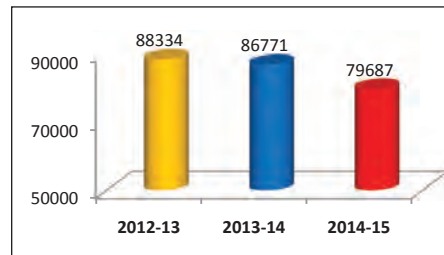
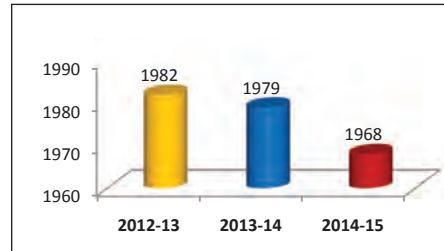


Figure 6: Caustic Power Consumption (Kwh/T of Production)



Challenges Faced during implementation

In the absence of a consultant, documentation and establishing of various processes was challenging, but the strong internal team with experience indocumentation helped. An Energy Management System cannot be effectively implemented without the involvement of bottom line people and the plant is manpower intensive; three plants at one place made the process little difficult. Awareness programs and campaigns helped educate people and encouraged them to participate actively.

Benefits of ISO 50001: 2011

- Improved understanding within the team
- Focus on micro level projects which could enhance productivity
- Improvements in monitoring and measurement
- Involvement of the team
- Reduced power consumption
- Achievement of PAT targets.



Mr. H. S. Dagur
Unit Head,
Indian Rayon, Veraval

“Energy performance is the key factor in sustainable development, ISO 50001 will definitely add value towards our journey to excellence.”



Mr. D. R. Kamat
Joint President
Caustic & Power Plant
Indian Rayon, Veraval

“Development and increased human activities have significant impact on global environment, economy and society. Hence energy management system ISO 50001:2011 is an effective tool to address climate change issue.”



Mr. A. B. Sojitra
AVP (QA & TS) – VFY
Indian Rayon, Veraval

“Energy is the most important part of our daily life and availability of the resources is depreciating day by day. ISO 50001 is one of the steps towards journey to excel in energy performance.”

