

Success Story under RKVY

- 1. Title :** Bhopal Dairy Plant Automation
- 2. Category :** Animal Husbandry
- 3. Challenges :**

Bhopal Sahakari Dugdha Sangh Maryadit (BSDSM) is affiliated to Madhya Pradesh State Cooperative Dairy Federation (MPCDF), Bhopal. Since its establishment it has gained the reputation of an organization dedicated to provide quality milk and milk products to its consumers and benefitting its rural milk producers. It has worked as a bridge between rural milk producers and urban consumers.



The total requirement of milk in Bhopal city and its adjoining areas is about 5-6 lakhs liters per day (LLPD). The present processing capacity of Bhopal dairy plant is 3.00 LLPD. Rest of the demand was fulfilled by other suppliers like Saurabh, Amul and largely by an organized sector in the form of loose milk.

During 2015-16 BSDSM had 2389 functional primary milk cooperative societies with total membership of 95,923. The total quantity of milk procured was 4.23 lakh Kg through them. Organization of Dairy Cooperative Societies (DCSs) is a long term commercial organization. Milk potential villages have been identified on the basis of Animal Census 2012 and Milk Unions are trying to cover most of the potential villages through organization of DCSs. Before implementation of the project, the main challenges faced by the Bhopal dairy plant were as follows :-

- At each stage all process were manual, including mechanical process of pasteurization, temperature control, maintaining flow data, cleaning process and tracking the record.
- The plant was not automated.

- PLCs were not connected.
- There was every chance of over filling of tanks , causing over flow of milk and there by wastage.
- All the process were extremely time consuming.

4. Initiatives :

BSDSM had received grant of Rs 9.5 Crores under Rashtriya Krishi Vikas Yojana(RKVY) for Up gradation and Automation of Bhopal Dairy Plant. The project was taken on priority basis & contractor for supply, installation & commissioning of Automation work was selected through tendering process as per Stores &Purchase rules of MPCDF. The main initiatives taken to develop the plant were as given below :-

- Full scale automation.
- Milk reception.
- Establishing Chilling plant.
- Storage in raw milk silos .
- Operation of Pasteurization.
- Separator.
- Homogenizer.
- Milk dispatch.
- Automatic Packing center.
- Tankers and batch formation.
- Cleaning in place . etc

The milk process

Every day, raw milk is delivered from the dairy cooperative societies to the main dairy plant for processing and product making. At each stage of the process, critical information-such as pasteurization temperatures and flow data from the cleaning process-must be tracked and recorded. Automated data



collection has significantly increased the control mechanism for the day-to-day operation of the dairy.

The previous dairy systems were not automated & The PLCs were not connected, there was no reporting, and there was no traceability. It was also possible to overfill a tank, leading to unnecessary waste and, because the process was purely manual, it was time-consuming and inefficient. Previously, in order to



access vital process information, we had to go through piles of reports. But the new system automates everything, and we can now provide critical process information to the people who need it to make important quick business decision

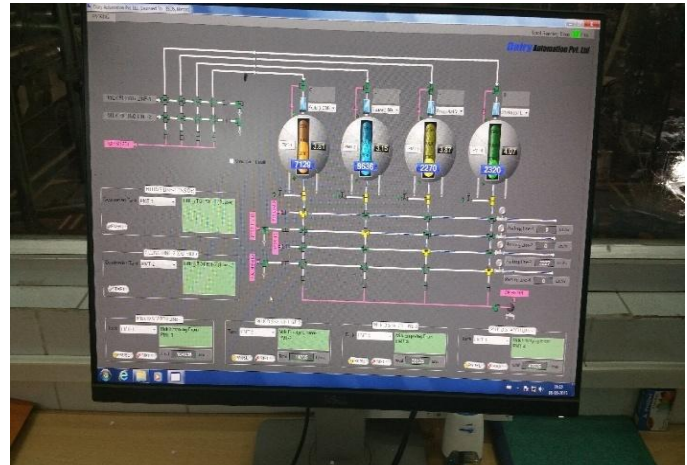


Bhopal dairy plant is the first dairy in the Madhya Pradesh to be computerized with the existing facility and equipments. Dairy Automation Pvt.Ltd. has successfully introduced full scale automation of all critical process like Milk reception, Chilling, Storage in raw milk silos, operation of pasteurizer, separator,

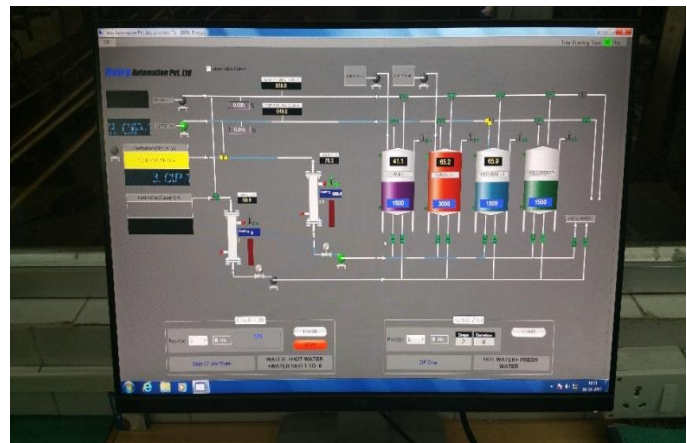
homogenizer, milk dispatch to Packing section and Tanker, batch formation and Cleaning in Place (CIP) with modernization of equipment. The complete project is implemented on turnkey-basis by M/s Dairy Automation Pvt. Ltd., which is an Indian company with the technical base in Houston(USA), with mutual support of technical and engineering staff at BSDSM. The modernization was done by implementation of an integrated Computerization /Automation solution using a plant-wide network of PLCs and PCs over GIGABIT Ethernet.

How does it work?

With this the entire processing operations are carried out from an air-conditioned control room. Information of milk at various stages are closely monitored, recorded and controlled by the computers and ABB PLCs. On top of this there is an umbrella Management Information System (MIS) to maintain the record and communication to the laboratory for quality assurance.



Automation is introduced at various stages like milk storage in silos: centralized monitoring and control of all pasteurizers (maintained exactly at required levels and ensures proper pasteurization). Milk silos are connected with the quality control laboratory for on-line approval process.



Cleaning of one lakh litre capacity silo is also done by computer. In ordinary systems, it is difficult to monitor cleaning and maintain quality standards. At dairy plant, all parameters such as concentration of cleaning agents and temperature of water to be used for rinsing are stored in the system with no room for error. In totality complete system offers qualitative & financial benefits and apart from this increased working efficiency, saving in energy, water and recovery of cleaning solutions.



5. Key Results :

- Critical control points have been taken care of resulting improvement in quality of processed milk
- Very less manual operations so the losses are also low.
- Timely Cleaning In Place (CIP) improved quality
- Reprocessing is avoided therefore the energy is saved
- Improved accuracy due to automation, chances of human error have been minimized.

6. Impact

- Optimum utilization of critical resources like water, electricity, refrigeration, steam and manpower
- Strict process monitoring at all levels
- Reduction in processing loss of milk
- Timely maintenance of equipment
- Strict adherence to ISO and HACCP norms

Most of the dairy plants in the country are automated. Now in MP we are planning for automation of all the dairy plants working under cooperative sector.

7. Lessons Learned :

Some compatibility issues with the existing machinery were faced. The issues were resolved by calling the representatives of the manufacturers of plant and machinery and Dairy Automation Private Ltd.

Due to benefits of automation it needs to be replicated in all dairy plants.

8. Additional Information :

List of all partners

- i. Officers and staff of main dairy plant of Bhopal Milk Union
- ii. Officers and staff of Dairy Automation Private Ltd.

Contact person for this story

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