



## Supporting Self-Directed Work Teams

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Self-Directed Work Teams (SDWTs) can be a highly effective approach to many manufacturing situations. They empower employees, shorten decision processes and increase accountability, yet they must work within the larger context of their company, suppliers and customers. SDWTs require changes in many of the administrative, supply, maintenance and support functions that surround them.



Caterpillar Inc. implemented SDWTs at its Transmission Business Unit (TBU) transmission casings plant in Dyersburg, TN in 1996 when the facility first came online. This paper will describe Caterpillar's approach to SDWTs and the opportunities and challenges that the methodology presents for outsource service contractors that support the teams.

SDWTs substantially shorten the communications chain and give Caterpillar's production associates much more contact with outsource provider management and staff (in this case UNICCO). By way of background, UNICCO was brought in to support production and was on-site throughout the startup process. So, from the beginning, we have been functionally aligned with the Dyersburg production process. We support Caterpillar with warehouse, shipping & receiving, gage crib and maintenance crib operations where UNICCO owns the MRO stores inventory. We also take care of grounds, building maintenance and janitorial services for the 220,000 sq. ft. facility.

### **Caterpillar SDWTs are independent units**

Caterpillar has set up 15 SDWTs at the plant, which was designed from the ground up to support the SDWT team approach. Each team is completely responsible for all aspects of production and is essentially a profit and loss center that carefully monitors its own production output and quality. There are financial incentives given to the teams that meet or exceed production plans.

The teams are the result of an empowerment program that relies heavily on open communications within teams and across the plant. At Caterpillar, they have replaced the typical manufacturing hierarchy with SDWTs and established boundaries so associates know what the big picture is, what the operational guidelines are, and who is responsible for what. With empowerment comes accountability. Many manufacturing consultants believe SDWTs are the most effective way to combine empowerment and accountability to increase and maintain associate job satisfaction and commitment, as well as production and quality, while reducing operating costs.

The teams themselves are microcosms of a typical company. Each team has eight spokes that address all of the functions needed to operate. The wheel diagram is used because there is no real beginning and end since each function is totally dependent on the others.



**Machinist** – This is the primary production function within the SDWT. Machine setup and production oversight falls to the associate at this position.

**Continuous improvement** – This is a combination team-level QC associate and process engineering position. The associate in this position works with the other team members to develop and implement process changes that can improve quality and efficiency while reducing costs.

**Support services** – This position works with all of the support services, including the outsourced services that UNICCO provides, to ensure the smooth operation of the SDWT's business.

**Customer value** – The customer value associate is essentially the customer's representative on the team. This position evaluates ways that the customer's experience, from product quality to order management, can be improved.

**Materials** – As the title implies, this position is responsible for materials management in the Just-In-Time (JIT) environment and within the work team.

**Financial** – Since each work team is a profit and loss center, the financial associate plays a key role. He or she is essentially the accounting department for the work team.

**Logistics** – The logistics associate is responsible for a range of support issues to help maintain production.

**Human resources** – This associate is responsible for all HR activities including pay, benefits and vacation policy administration, as well as conflict resolution and other personnel management issues.

Every associate is rotated through all of the spokes of the wheel so they understand each other's responsibilities and are totally cross-trained. Spoke assignments generally last six months; over the course of a few years, an associate is given responsibilities for every spoke. The entire operation is held together by each member's communications skills and a training regimen that covers not only overall team dynamics, but the specifics of each skill set required by the spokes.



Training is an ongoing process for the SDWTs. Caterpillar holds weekly spoke meetings that bring together the associates from all of the SDWTs on a shift responsible for a particular spoke, logistics, for instance, in order to give training and to discuss current issues. The associates use the spoke meetings to learn their different skill sets and to share tips and techniques with each other.

Since the Dyersburg plant is a three-shift operation, teams are responsible for handing off production to the next shift's team. At each shift change there is a turnover meeting where the teams discuss production issues, changes and anticipated events, such as preventive maintenance.

Production continues while the spoke and turnover meetings are held since cross-trained associates can continue the process while other associates attend the meetings.

#### **SDWT support – more intense/personal**

The teams are highly focused on their objectives and each team associate has wide authority within his or her realm. For the organizations that support the teams the rotating responsibilities and teams' autonomy create unique challenges and opportunities.

UNICCO's role at Dyersburg is closely intertwined with the SDWTs. Since we provide critical logistical support, we directly affect the production, quality and profitability of each team. This puts us in close contact with several of the individual spokes at each SDWT.

A second fact is that, since associates rotate through the skill spokes, we end up working with everyone on the SDWT over time. The result is that we have a much larger number of customers at Dyersburg than we do in a typical plant of its size.

The advantage for UNICCO is that we do not have to go through a management hierarchy to get answers to production issues. Each team associate has the authority and the knowledge to immediately answer questions and solve problems. In fact, Caterpillar does not have management on the plant floor.

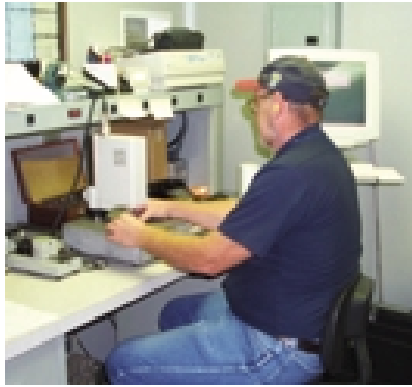
SDWT associates can requisition almost anything they need to support the team. If they determine that a new material handler, or different lighting, will benefit production, and the other associates of the team agree, they can issue a work order and UNICCO will complete the project. As mentioned earlier, each team has profit and loss responsibility, as well as accountability, for its function. Therefore, any work that UNICCO does is charged directly back to the team's cost center and is factored into their overall

profitability. For this reason, team associates can be hard taskmasters. They understand the relationship between their success and the support that UNICCO provides.

UNICCO is driven by all of our SDWT customers to improve processes and reduce costs. We interface with several spokes on the wheel and several teams so we have to maintain balance. Our agreement with Caterpillar is that we will meet our performance objectives, period; but, just like the SDWTs, we have the autonomy to implement innovations required to do so, subject to the terms and conditions of our agreement.

Some of our major interfaces include:

**Gage crib and tooling support** – This function is critical to the success of every team. UNICCO is responsible for calibrating production gages and maintaining tools. This is separate from Caterpillar's Coordinate Measuring Machine Systems which are run by Caterpillar to check the quality of the finished product produced by the SDWTs. Faced with the combined challenge of maintaining quality and reducing costs, we decided to do the instrument recalibrations and recertification ourselves in the plant. This substantially reduced both turnaround time and costs which benefited every SDWT.



**Maintenance** – Multi-skilled technicians, a good Preventive Maintenance program and collaboration are the keys to the success of the teams. We work closely with each of the teams in the three-shift operation to make sure that the machinery is maintained at the optimal level with minimal downtime. We are required to maintain above 97.3% machine availability and to respond to emergency work orders within 30 minutes. This requires that we have an adequate spare parts inventory at all times. No team wants to have their production or quality affected by poor maintenance or the lack of spare parts. UNICCO also performs project work and retrofitting, so we have to coordinate closely with SDWT associates to schedule major projects.

**Shipping & Receiving** – These two functions are closely aligned with SDWT operations at Dyersburg since the plant uses JIT logistical support. Enterprise Resource Planning (ERP) systems connect the teams to the logistical support systems, including shipping & receiving, to ensure smooth operations. As materials are required or a production run is completed, UNICCO staff are automatically



notified and dispatched. Our responsibility is to administer the supply chain to ensure material availability to all teams at all times. We also manage the disposal of scrap metals.

**Financial** – Every transaction with a SDWT generates an accounting event. Through the Computerized Maintenance Management System (CMMS), implemented by UNICCO, all transactions are recorded and posted daily to the SDWT's account and each account is managed like a separate customer. This facilitates a higher level of accountability, as well as increased attention to detail and quality by both the SDWTs and UNICCO.

The service provider in a SDWT setting must work with associates on several spokes at any given time. This approach creates personal, peer-to-peer relationships that require high levels of trust and, most of all, communications. Good communications are essential and the key to Dyersburg's success. By sharing accurate and timely data UNICCO is able to work integrally with the customer so they can develop and maintain smooth manufacturing operations that turn out consistently high-quality parts at competitive cost.

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