

Case Study Southern Toro Distributor, Inc.

The following conversation was held between Joe Melaney, general manager and owner of the Toro distributorship in Galveston, Texas, and his son Joe Jr.:

Joe: I called you in this morning to discuss the future of the company. I feel that you should be involved in more of the decision making around here because you will be taking over the company soon. Roger Kirk, the district sales manager from Toro, will be contacting us next week for our spring season order. We will need to order for the entire irrigation line at that time. (See Exhibit 1.)

As you know, we have been undergoing a number of changes around the office. One of our major changes was acquiring the RyTech computer system. A computer run I received this morning combined with the upcoming order date started me thinking about the figures from the new computer. I was thinking back on the circumstances that led up to the purchase of the computer a year ago in October 2008. With the way costs are skyrocketing, I had to cut down on my inventory without cutting service. The RyTech representative said he could cut our inventory level by 30 percent, which sounded good enough for me. So I contracted with RyTech for the new software.

Max, our irrigation manager, swears by the numbers he gets out for order quantities. When

this package was put into our computer, they (RyTech reps) said it was suitable for me, but I'm not sure that I can trust it. You remember the problems RyTech had getting it running. If they have problems like that, why should I trust it to tell me how to spend millions of my dollars?

Joe Jr: You mentioned that RyTech installed the software for us. How did they select the decision rule used in determining the order quantities?

Joe: I can't answer that. The consultants that came in told me the best way to determine the order quantities for my company was to use an economic order quantity (EOQ) and a reorder point for every item. (See Exhibit 2.) They said this was the best because we have three set order points during the year. I'm comfortable with the order point, but I'm not sure of the EOQ. I can tell you how the EOQ was made for us. They based it on the demand quantities from the past four years. (See Exhibit 3.) RyTech said that they did not see the need for any additional measures. They also said it would work very smoothly since it wasn't necessary to change the EOQ once it was in.

As I said earlier, I'm not sure of the EOQ. You know how I've depended upon my gut feel for the market in the past. I've always ordered parts based on past usage. Then I adjust the numbers according

EXHIBIT 1 Irrigation Products, Inc., current inventories, October 15, 2011.

Product Description	Current Inventory (units)	Current Inventory (\$000)	FY 2011 Sales (\$000)
Free controllers series 150—4 + 8	283	12	15
Customer controllers series 123—8 + 11	68	8	12
Monitor controllers series 176—11 + 23	51	15	26
3/4" + 1" valve globe/angle in-line	4,430	46	78
1 1/2" + 2" valve globe/angle in-line	281	6	62
Brass valves series 216	334	4	7
Pop-up bodies	50,841	20	77
570 series nozzles	90,056	14	68
Stream rotors series 300	2,043	13	144
Rain pros series 320	1,782	12	26
Gear driven rotary series 600	1,086	10	22
Gear driven rotary series 620	681	21	39
Gear driven rotary series 640	2,627	81	194
Gear driven rotary series 670	973	36	180
Totals	155,536	298	950

Prepared for use in class discussion by Roger G. Schroeder, E.R. Kunde, and Sue Flach.

EXHIBIT 2 Current computer system rules.For order quantity size:^{*}

$$EOQ = \sqrt{\frac{2AD}{ic}}$$

A = cost of placing an order, \$

D = annual demand in units

i = "interest rate" for holding inventory for a year as a proportion of the unit cost

c = unit cost of the item, \$/unit

EOQ = economic order quantity

For reorder point:

$$R = \text{average demand over the lead time} + \text{safety stock}$$

R is the reorder point where an order for more stock is placed. Currently, a 12-week lead time is used for all items in setting the reorder point.

^{*}The current computer system uses a carrying cost $i = 30\%$ (20% cost of capital, 5% obsolescence, and 5% storage cost) and an ordering cost of \$10 per order.

EXHIBIT 3 Demand for fiscal years 2008–2011.**Part #1-7287 Timing Motor with Gear Service Assembly (for Monitor Controllers)**

Distributor net \$12.00

Selling price \$26.00

	2008	2009	2010	2011
Unit sales	30	19	22	31

Current inventory = 9 units

Reorder point = 16 units, EOQ = 12 units

Series 230, 1" Valves

Distributor net \$10.35

Selling price \$13.75

	2008	2009	2010	2011
Unit sales	5210	3650	4441	5673

Current inventory = 4,430 units

Reorder point = 2,070 units, EOQ = 173 units

Series 176, Monitor Controller

Distributor net \$301.46

Selling price \$400.00

	2008	2009	2010	2011
Unit sales	21	12	41	65


Current inventory = 51 units

Reorder point = 22 units, EOQ = 2 units

to how many golf courses I expect to be built or modified, and on the contractors'/installers' comments on how they expect the spring to go in terms of the number of installations. I also meet with

friends in the building industry to see what they expect in terms of housing starts for the spring. My only other adjustments come if I think a particular product isn't moving. I feel all goods should turn

EXHIBIT 4 Series 230 and 240—Automatic valves, 3/4" & 1" electric and hydraulic versions normally open, pin-type, 24 V.A.C. electric.



SERIES 230 & 240—AUTOMATIC VALVES
3/4" & 1" ELECTRIC AND HYDRAULIC VERSIONS
NORMALLY OPEN, PIN-TYPE, 24 V.A.C. ELECTRIC

Application

- Underground automatic systems with G.P.M. demand of 1 G.P.M. to 50 G.P.M.
- Residential or commercial
- Electric systems
- Normally open systems—dirty or clean water
- Pin-type systems—clean water

Features

All

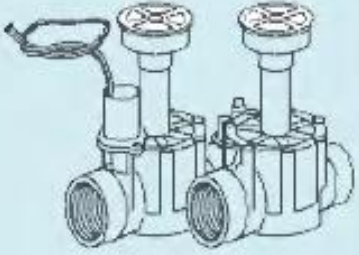
- Globe valve for easy installation
- Economical/competitively priced
- High flow/low pressure loss
- Manual bleed
- Smooth opening and closing
- Opens and closes at low flow and pressure
- Bleed ports protected with built-in filter

3/4"

- Corrosion resistant, glass filled nylon construction
- Small size, big performance

1"

- 230 series has manual flow control
- Corrosion resistant, Cyclocac® and stainless steel construction
- Stainless steel reinforced solenoid
- Stainless steel collar over threaded 1" I.P.S. outlets



1"–230 SERIES
ELECTRIC or HYDRAULIC
with FLOW CONTROL

Specifications

<p>3/4"</p> <ul style="list-style-type: none"> • 24 V.A.C. <ul style="list-style-type: none"> .36 amps inrush .18 amps holding • Working pressure <ul style="list-style-type: none"> 150 PSI maximum 25 PSI minimum • 3/4" I.P.S. male thread inlets • Dimensions: 3"H, 4"W 	<p>1"</p> <ul style="list-style-type: none"> • Electric models 24 V.A.C. <ul style="list-style-type: none"> .400 amps inrush .200 amps holding • Working pressure <ul style="list-style-type: none"> 150 PSI maximum 10 PSI minimum • Dimensions: 230—6"H, 4 1/2"W 240—4 1/2"H, 4 1/2"W
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over at least three times a year. There are two items I am worried about at the present time because of that exact problem. One is the timing motor with gear service assembly (Part #1-7287), a low-volume service part carried for repair of monitor controllers, and the other is the Monitor Controller (Series 176) carried as an "insurance" end product for a few specialized customers. (See Exhibits 4 and 5 for

detailed descriptions of the Monitor Controller and the Series 230 valve.)

Joe Jr: I haven't heard you mention the problem of running out of products. We have been having quite a problem with running out of the Series 230 1-inch valve, a high-demand part that we use all the time. How would you handle this in

EXHIBIT 5 Series 170—Monitor II automatic controllers: 11 & 23 station, hydraulic and electric.

**SERIES 170—
MONITOR II AUTOMATIC CONTROLLERS
11 & 23 STATION, HYDRAULIC AND ELECTRIC**

Application

- Heavy duty commercial
- Outdoor—wall or pedestal
- Parks—schools—cemeteries—condominiums—commercial buildings

Features

- 0–60 minute timing per station (infinite adjustment)
- 14-day programming capability—easy to set
- Automatic, semiautomatic, or manual operation
- Multicycling program—easily set
- Fused circuit protection—U.L. listed
- Dual programming on electric models (turf can be watered more frequently than shrubs)
- As many as four TORO electric valves can be operated on each station of electric models
- No time lag between stations
- Pump start circuit standard (can also be used as a master valve control circuit)
- Locks are provided for timing mechanism cover and pedestal cabinet door
- Supply line filter included on hydraulic models
- Hydraulic models resist freeze-related damage
- Controller can be operated manually even if the timing mechanism has to be removed (use Model 995-24 accessory for electric models)
- Built-in transformer on electric models
- Housing is heavy gauge steel, treated with rust inhibitor, and painted forest green
- Mounting template for easy installation in concrete included



**CONTROLLER
SERIES 170**

Specifications

- 45 V.A., 24 V.A.C. transformer (built in)
- Lightning protection devices available for lightning-prone areas
- Dimensions—Wall Mount 8 $\frac{1}{2}$ " × 10 $\frac{1}{2}$ " × 8 $\frac{1}{2}$ "
Pedestal Mount 8 $\frac{1}{2}$ " × 12 $\frac{1}{2}$ " × 31 $\frac{1}{2}$ "
- 115 V.A.C. input—24 V.A.C. output
- 2 separate ground wires required to utilize dual program
- Using normally open valves, tubing length from controller to valve should not exceed 1000 feet
- Refer to page 30 for maximum number of valves allowable per station and other technical data

ordering? I know that we tend to disagree on what level of inventory should be held. I don't think you are carrying a high enough inventory level on all parts to satisfy our customers. You have always said it is critical to the survival of the company that we have satisfied customers. I would tend to believe that this would require us to always have what our customers need on hand. The other problem I see resulting from stockouts is a

loss of customers to our competitors. Any customer whose order we cannot fill will go to Rainbird, Weather Matic, or Nelson. Any of these competitors could supply the customer with comparable equipment, and once the customers have made the change, how do we get them back?

Joe: I don't have the storage capacity to carry enough inventory to protect ourselves from ever

EXHIBIT 6 Irrigation division FY 2011–2012 stocking program, terms for southern distributors.

Order Placement	Shipping Period	Dating Terms
33% 2011 Forecast Oct. 15–Oct. 30	December and January	1/2 May 15—net 1/2 June 15—net
33% 2012 Forecast Feb. 15–Feb. 30	May and June	1/2 Sept. 15—net 1/2 Oct. 15—net
33% 2012 Forecast June 15–June 30	August and September	1/2 Nov. 15—net 1/2 Dec. 15—net

EXHIBIT 7 Galveston market information.

SFDHH* \$15–19M	SFDHH \$20–24M	SFDHH \$25–34M	SFDHH Total \$35+ SFDHH	Total Population
228,545	182,607	151,110	89,375	757,000
Number of golf courses: 158				
Number of golf course holes: 2,259				
Irrigation potential market (in purchases from Toro): [†]				
Small turf [‡]	\$403,830		Number of cemeteries: 71	
Large turf [‡]	267,048		Number of parks: 14	
Parts	75,160		Number of schools: 170	
Total	\$846,038			

*Number of persons living in single-family dwelling households (SFDHH).

[†]This is an estimate of the market size for Toro in the area.

[‡]Small turf refers to residential installations while large turf refers to golf courses and other commercial installations.

having a stockout. My philosophy has been that you can't always satisfy the customer from on-hand inventory. But you better be able to satisfy them 90 percent of the time. When you don't have it on hand, you can usually get it from another distributor. It usually is a fairly fast process because we fly the parts in. Too bad we can't place rush orders with Toro, but they hold us to their standard ordering policy (Exhibit 6).

That reminds me, we have to face a possible stockout problem this year. When I was at the country club last week, George, the general manager at the club, was talking about the number of times their sprinkler system had failed. George mentioned that he had spoken to the board about replacing the system. While the board wouldn't commit themselves until the annual meeting in December, George felt that it was going to be approved. If they installed the system, they wanted it ready to go by their annual tournament in early April. George said his first choice would be us if we could supply the system within the time specified. This contract would be a highly profitable one. As

you know, the course is 390 acres, and the entire system would have to be replaced. The replacement system would rely heavily on the use of the Series 230 valves.

Because of the size of the club's system, I checked with my banker on the cost of financing. Bank notes were quoted at 9 percent. I'm not sure whether I should risk financing, so I'm looking at cutting back in the spare parts area, where a lot of our cash is tied up. I figured that we have 25 percent of our inventory just sitting in the warehouse collecting dust. Many of these items are used by only a few of our customers. If I decide against the latter technique, we would have to rent storage space to handle the parts for the golf course installation. When I checked into this yesterday, I was quoted a price of \$3.27 per square foot per year for rented warehouse storage space.

To assist in determining the appropriate quantities and to get a little insight into the chance of the club's installing the system, I called the National Weather Service this morning. They stated

EXHIBIT 8 Income statement (fiscal years ending June 30).

	2009	2010	2011
Net sales	\$3,900,000	\$3,500,000	\$4,200,000
Cost of goods sold	2,800,000	2,700,000	\$3,200,000
Gross profit	<u>\$1,100,000</u>	<u>\$ 800,000</u>	<u>\$1,000,000</u>
Expenses			
Selling expense	\$ 440,000	\$ 272,000	\$ 350,000
Operating expense	455,000	318,000	400,000
Fixed expense	95,000	100,000	115,000
Total expenses	<u>\$ 990,000</u>	<u>\$ 690,000</u>	<u>\$ 865,000</u>
Net profit from operation	<u>\$ 110,000</u>	<u>\$ 110,000</u>	<u>\$ 135,000</u>
Other expenses	\$ 75,000	\$ 60,000	\$ 85,000
Income	15,000	10,000	25,000
Net profit before taxes	<u>\$ 50,000</u>	<u>\$ 60,000</u>	<u>\$ 75,000</u>
Taxes	12,000	27,000	36,000
Net profit	<u>\$ 38,000</u>	<u>\$ 33,000</u>	<u>\$ 39,000</u>

EXHIBIT 9 Balance sheet (fiscal years ending June 30).

	2009	2010	2011
Assets			
Cash	\$ 10,000	\$ 35,000	\$ 5,000
Accrs. receivable	\$492,000	\$ 622,000	\$647,000
Less doubtful accts.	<u>17,000</u>	<u>22,000</u>	<u>22,000</u>
Net accts. receivable	475,000	600,000	625,000
Inventory	620,000	600,000	1,000,000
Total current assets	<u>\$1,105,000</u>	<u>\$1,235,000</u>	<u>\$1,630,000</u>
Prepaid expenses	\$ 30,000	\$ 30,000	\$ 20,000
Equipment (net of depreciation)	35,000	40,000	45,000
Total fixed assets	<u>\$ 65,000</u>	<u>\$ 70,000</u>	<u>\$ 65,000</u>
Total assets	<u>\$1,170,000</u>	<u>\$1,305,000</u>	<u>\$1,695,000</u>
Liabilities			
Notes payable (to banks)	\$ 207,000	\$ 329,000	\$ 700,000
Current position of long-term liabilities	20,000	20,000	20,000
Total current liabilities	<u>\$ 227,000</u>	<u>\$ 349,000</u>	<u>\$ 720,000</u>
Long-term liabilities	160,000	140,000	120,000
Total liabilities	<u>\$ 387,000</u>	<u>\$ 489,000</u>	<u>\$ 840,000</u>
Capital stock	\$ 200,000	\$ 200,000	\$ 200,000
Retained earnings	583,000	616,000	655,000
Net worth	<u>\$ 783,000</u>	<u>\$ 816,000</u>	<u>\$ 855,000</u>
Total liabilities and net worth	<u>\$1,170,000</u>	<u>\$1,305,000</u>	<u>\$1,695,000</u>

they expected the driest spring in five years. I'm not sure to what extent this would affect the sales of the irrigation products. To assist in determining the effect of weather on the sales, I have gone over the demand figures and the corresponding weather for the last five years. In 2008

and 2009 I greatly overstocked. During these years, the weather was extraordinarily wet and cloudy. During 2010 the reverse conditions existed. It was an abnormally dry season, and we stocked out of most of our goods. (See Exhibit 7 for more market characteristics.)

EXHIBIT 10 FY 2011 departmental analysis (\$000).

	Total	Consumer Products	Commercial Products	Irrigation Products	Parts	Service
Net sales	\$4,200	\$1,800	\$850	\$950	\$550	\$50
Cost of goods sold	<u>3,200</u>	<u>1,435</u>	650	750	350	15
Gross profit	\$1,000	\$365	\$200	\$200	\$200	\$35
Gross profit	23%	20%	23%	21%	36%	70%
Ending inventory	\$1,000	\$275	\$250	\$295	\$180	

Joe Jr: With a business that is subject to the whims of nature, why do you stay in it? Is it really worth beating your head against the wall to get the kind of return on investment that we have been getting? Even though we get a 25 percent markup on all irrigation items, the results do not always appear on the bottom line. Maybe we could manage our inventories better and really make the business worthwhile. (See Exhibits 8, 9, and 10.)

Joe: In the past I stayed in this business because I started the business. It's my baby. I felt a great deal of achievement from it. I've always planned to pass the company on to you and let you operate it. Now is the time for you to decide how you would run this company if you were in charge and if the return on investment is good enough

for you to be satisfied. We also have to decide what to order from Roger Kirk when he arrives next week and what to do about using the RyTech system. I have another meeting now, but I would like to get back to this discussion later.

Discussion Questions

1. What would you recommend that Joe Jr. do, assuming he takes control of Southern Toro?
2. Evaluate the importance of inventory and inventory management of the Southern Toro distributorship for both irrigation products and spare parts. Should the inventory be cut back?
3. Evaluate the current inventory management system at Southern Toro. What inventory management system would you recommend?