

7.3 Comparison of Purchase Parts and Selection by DTC Procedure

7.3.1 First Information Collection Phase

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7.3.6 How to Guide Vendors to Implement DTC Activities

An explanation of the whole flow of basic DTC procedures has been given to this point. There is another important procedure necessary for achieving the DTC target cost. That procedure is a comparative selection of the purchase parts and DTC steps to be implemented by the vendors of the purchased parts. The main points will basically be the same as those of the DTC procedures, which have been explained. Rational selections of the purchase parts should follow the stages below, and estimate comparison should be carried out at least twice, in stages 1 and 4. By doing so, realization will be possible.

7.3.1 First Information Collection Phase

This is the phase where you collect information on what goods cost how much and how goods can be procured in the real world. Of all the information, you should pick up a minimum of 2 or 3 possibilities which will have potential with regard to the objective of designed products.

For this information collection, use the first quotation request form shown in Figure 7.3-1. Carry out all the transactions through a single specified section for material procurement whether within industry or government. Do not adhere to past sequences. Send a request for a quotation with Buyers' Terms and Conditions for high priced goods directly to manufacturers. In principle, do not go through trading companies. When the quotation comes back from the manufacturer, further information should be collected from the manufacturer. If the response comes from a trading firm, consider the trading firm route for carrying out the transactions. (This is the only way you can be sure of the formal purchase route of the new goods from manufacturers.)

In order to simplify the latter comparison steps, designate one of the two or three plans obtained from the information collection as the baseline plan (standard plan for comparison). Consider it a standard of comparison steps. In this case also, it is important to request an Escalation Formula, shown in Figure 7.3-3, from vendors. The formula can also be seen in the first quotation request form (Figure 7.3-1) under 8-(2), showing the upper limit of the price correction necessary when there is a change in labor costs or in price indices. If you wish to have an estimate for comparison for various design combinations, do not hesitate to ask by listing them all as an attachment to the estimate request.

7.3.2 Basic Concept Comparison Phase

Look into purchases whose possibility was confirmed in the previous stage. See what combinations are possible, and what kind of outcome would result. Examine the various possibilities within the in-house design team or, in some cases, with the candidate manufacturers. (Also consider the method at the upper system level and trade of the composition.)

7.3.3 Breakdown and Combination Phase

In order to make the plans for possible combinations mentioned above, decide whether procured goods should be used with or without adjustment, or whether newly developed goods should be chosen. Arrange the specification plans to be discussed with manufacturers.

7.3.4 Second Information Collection Phase

With regards to the above specification plans, submit a quotation request for the specifications of precisely what you want. Refer to the form in Figure 7.3-2, and also request opinions from the manufacturers. Coordinate the technology and costs. For newly developed or remodeled goods, traders may be able to implement DTC as well. Hence, ask for quotations for the following two cases, and clarify the possibility of the implementation of DTC on the vendor side.

Formal estimates: Estimates of competitive price by design and production with past technology and manufacturing methods, with its price/cost breakdown table (Table 7.3-2)

DTC possibility estimates: Challenging estimated price showing what examinations, if adopted, will bring what cost, concerning the above.

For challenging estimates, attach a list showing how much cost reduction is expected if such and such contents and conditions are satisfied. This attachment should follow the list format for measures to achieve the target costs in each phase (Figure 2.5-5 of Chapter 2.5, WBS Phasing Theme Technique)

At this point, the differences in the numerical values of the estimates should be considered as a clue to the possibility of DTC (Think about which is more beneficial in cost). In addition, include the reliability and consider it an evaluation factor when selecting vendors. The candidate vendors are required to agree to the basic agreement for materials transactions (Note) of articles in Material 7.3-1, as preconditions, so that the DTC will be accurately implemented. (When dealing with foreign vendors, submit the Basic Buyer's Terms and Conditions of the same contents first, and get the vendors to agree to it.) When you finish these preparations, move on to the next stage.

(Note) Within Japan, the excerpt of the basic agreement for material transactions of the Japan Materials Management Association (Material 7.3-3) and Notification No. 209 of the Ministry of International Trade and Industry (notified on June 11, 1986) (Material 7.3-4) form the basis for agreement with vendors. This excerpt should include a provision saying Articles 5, 20, 27, and 38 will also apply to C and so forth, especially when trading firms are involved.

(Note) When dealing with foreign companies, insert an article of Discontinuance by Seller into the Buyer's Terms and Conditions. This is to have them turn over the manufacturing information in case they become bankrupt or decide to discontinue manufacturing.

7.3.5 Vendor Selection Phase

You have now gone through all the arrangements for final estimates. Here, you will carry on comparative evaluations of various aspects and will finally be choosing the purchase goods. There are some cases where you continue to adopt two different procurement sources in parallel for two purchase goods. That may go on until the production of the prototype or mass-production begins. Even if you are able to narrow it down to one manufacturer, keep a good relationship with other candidate manufacturers. Also, keep the purchase goods from the other manufacturers in mind because you never know what will happen. Remember to send candidates thank you notes for earlier considerations, and always preserve another possible procurement route even after the final selection of the vendor.

Figures 7.3-1 and 7.3-2 are first and second estimate requests of information collection. They are example forms for you to utilize for different purposes. The proposal and estimate request format (Figures 7.3-4), and the summary of a specification quotation request (Table 7.3-3) are examples of formats to be attached to the quotation requests.

(1) Choose vendors in the following manner:

Choose, informally, the best candidate vendor at the vendor selection meetings with the design chief and others involved in the design.

The section in charge of purchasing should coordinate consultation with the best candidate vendor. Request the vendor to submit a memorandum, stating the conditions and DTC target costs.

For each purchase good under the above memorandum, carry on an in-house readjustment. Obtain a final decision regarding the selection of vendors in the meeting. Confirm the content of the conditions for the last time, and notify the vendor.

In the memorandum, remember to include a promise to adjust prices for the following cases: Price changes due to the Escalation Formula (the base for the upper limit cost adjustment as seen in Figure 7.3-3) and purchase lot size; for newly developed products, the rate of the learning curve in man-hours at the time of mass-production.

7.3.6 How to Guide Vendors to Implement DTC Activities

Follow the procedures below to lead vendors to implement DTC activities.

(1) Vendors will submit a draft of the DTC implementation plan document (i.e. DTC implementation plan document for equipment vendors) prior to the final vendor selection. The content of this implementation plan document will be used subject to vendor selection. The table of contents for the DTC implementation document plan is exemplified in Figure 7.3-5. Have the vendors submit this document plan for the approval of the person with the greatest responsibility. Then, stratify the DTC implementation document plan (Figure 7.3-6) as seen in Figure 7.3-7, which is the same as Figure 3.2-1. By applying the steplist to stratification, clarify what output of the DTC implementation plan document goes into what input of the steplist, and how the output of a specific steplist connects to what input of another steplist. Table 7.3-4 indicates a summary of the overall linkage, and Tables 7.3-5 (same as 3.2-2), 7.3-6 (same as 3.2-3), and 7.3-7 (same as 3.2-4) each illustrate the content of the steplist.

(2) Select the vendor. Approve the DTC implementation document that has been made following the above table of contents.

(3) Include the following in every interim report: current costs, the most recent outcome and DTC trade worksheet, how expedition of the phase-wise realization of the target costs is going, a gap analysis of DTC present costs and planned costs, and the work schedule and outlook up to the next report. (Use the format in Figure 7.3-8.)

(4) The report on current costs after achieving the DTC target cost should include the progress evaluation in grade of estimate, even if the numerical value is the same. When the actual value turns out to be larger than what had been planned, analyze to see whether there was a problem in planning or whether the management was insufficient. Request a report on further measures. (Call this an examination of the target cost achievement by actual results.)

(5) The secretary for DTC promotion should list up the DTC status reports obtained from each vendor, as seen in Figure 7.3-9, and promote the management of overall DTC activities by clarifying which part requires more intense management and guidance.

(6) When necessary, go to the vendor sites. Work on cost reduction with the vendors from the standpoint that a difference in numerical values shows a difference in technology (including management skills), based on the directions stated in Principle 6 in Chapter 5.2.3.

Fig. 7.3-1 Example of request for quotation to find out what, how and how much can be obtained in reality (Materials for feasible study)

(Detailed concept of escalation formula in 8-(2) item is shown in Fig.7.3-1, material7.3.1)

<u>OBJECTIVE TO BE QUOTED</u>		CONTROL NO. _____
		DATE _____
		SIGNATURE _____
1. PART NAME OR MATERIAL NAME		
2. OBJECTIVE OR EQUIVALENT PART NO. / MATERIAL NO. AND MANUFACTURER		
3. QTY/AIRCRAFT	4. SYTEM NAME (USED ON)	
5. MINIMUM REQUIREMENT OR MODIFYING REQUIREMENT		
6. QUALIFICATION TEST. NOT REQ'D. REQ'D,IF APPROVED ALREADY PROVIDE YOUR QUALIFIED DATA.		
7. QUESTIONNAIRE(PROVIDE US WITH DETAILED MATERIALS , IF ANY) (1) STATE THE AIRCRAFT MODEL NAME WHICH YOUR PRODUCT ADOPTED (2) ARE THERE ANY MTBF DATA?(MTBF=MEAN TIME BETWEEN FAILURE) (3) IS YOUR QUALITY ASSURANCE PROGRAM MIL-Q-9858A OR NOT?		
8. REQUIRED DATA FOR SELECTION (1) OEM PRICE CASE 25A/C PER YEAR CASE 50A/C PER YEAR CASE 75A/C PER YEAR (2) ESCALATION FORMULA (e.g) (3) eg. $\frac{p}{p_0} = 0.6 \frac{L}{L_0} + 0.4 \frac{W}{W_0} \left[\begin{array}{l} \text{Po. P : BASIC PRICE AND ADJUSTED PRICE} \\ \text{Lo. L : SOME INDICES FOR HOURLY EARNING OF WORKERS} \\ \text{Wo. W : SOME INDICES FOR WHOLESALE PRICE} \end{array} \right]$		
9. NOTES		

Fig. 7.3-2 Request for quotation for final selection

REQUEST FOR QUOTATION FOR FINAL SELECTION

CONTROL NO. _____

DATE _____

SIGNATURE _____

OBJECTIVE PART TO BE QUOTED: SEE COLUMN 6 FOR DETAILED SPECIFICATIONS AND RQT PART NO. NOMENCLATURE	
2. MANUFACTURER'S NAME	
3. QUANTITY / AIRCRAFT	4. SYSTEM NAME
5. QUANTITY TO BE QUOTED (1) DEVELOPMENT PHASE <u>DELIVER TO QUANTITY DUE DATE(AT EX-FACTORY)</u> (2) PRODUCTION PHASE(QUOTE IN " 77YEAR PRICE)NOTE:INFORM US LEAD TIME ARE CASE EACH/YEAR CASE EACH/YEAR CASE EACH/YEAR	
6. REFERENCES AND ENGINEERING REQUIREMENTS	
7. REQUIRED DATA TO BE PROVIDED WITH QUOTATION (1) ARO & YOUR TERMS & CONDITIONS (2) ESCALATION FORMULA	

Fig. 7.3-3 Example of escalation formula

SIC code on this page can be obtained by fax order refer material 7.3-1 and 7.3-2 on the next page

ESCALATION FORMULA

$$\text{e.g. } \frac{P}{P_0} = \left(\quad \right) \frac{L}{L_0} + \left(\quad \right) \frac{W}{W_0}$$

P_0, P ; BASIC PRICE AND ADJUSTED PRICE

L_0, L ; SOME INDICES FOR HOURLY EARNING OF WORKERS
(eg. SIC CODE 3721)

W_0, W ; SOME INDICES FOR WHOLE SALE PRICE

(Essential point) Request the escalation formula at first time RFQ/RFP

Also, make the question how P_0 depend upon QT'y discount and Learning curve of manhours.

Price Adjustment Formula

To give effect to the variation in the Wholesale Price Index (WPI) Entitled "Industrial Commodities" and in the Average Hourly Earnings for Standard Industrial Classification (SIC Code 3722) entitled "Aircraft Engines and Engine Parts" both published by the U.S. Department of Labor, the Prices of engines, optional equipment or other items for which price adjustment is contemplated by this Contract, will be adjusted annually, effective 1 January, using the following formula:

$$\text{eg. } \frac{P}{P_0} = (0.3) \frac{L}{L_0} + 0.7 \frac{W}{W_0}$$

Where:

P equals the adjusted price for Engines, or optional equipment or other items defined in the contract as subject to price adjustment, delivered during the applicable Calendar Year, but in no event shall the adjustment be greater than 6.8% per year cumulatively for engines scheduled for delivery prior to January 1982.

P_0 equals the Basic Unit Price for engines or optional equipment or other items defined in the contract as subject to price adjustment at the time of formula application as that Price may have been adjusted by negotiated changes made in accordance with other provisions of this contract.

W equals the average value of the WPI entitled "Industrial Commodities" for the year immediately preceding the year for which the price (P) is being calculated.

W_0 equals the average value of the WPI entitled "Industrial Commodities" January 1976 through December 1976, which is 182.2.

L equals the average hourly earnings for the SIC Code 3722 for the same period as W .

L_0 equals the average value of SIC Code 3722 for the same period as W_0 which is \$6.52.

In the event that either of the indices is not published in time to permit the adjusted price calculation prior to normal billing, engines will be billed at the preceding year's adjusted price and adjusted as soon as circumstances permit. In the event that either index is discontinued or an index base is changed, alternate indices will be selected and/or base index values will be adjusted in a fair and reasonable manner.

Reference Material 7.3-3 A Extracted Example of Basic Contract of Material Transaction prepared by Japan Materials Management Association

BASIC CONTRACT OF MATERIAL TRANSACTION

Co. Ltd.(hereinafter called and Co. Ltd.(hereinafter called "B") agree here as follows concerning to the basic items which is required to the contract of sales of material, equipment and parts or consignment manufacturing(including consignment repair; same in the following).

SECTION 1 CONTRACT

Article 1 Basic Contract and Individual Contract

- 1) The details specified in this Basic Contract shall be applied to all individual transaction (hereinafter called "Individual Contract") based on this contract between A and B unless otherwise specified.
- 2) A and B shall perform the contract according to the terms of Orderd placed by A and the dealing procedures, specifications, drawings and standards specified by A in addition to the terms of this contract.
- 3) A and B may exclude a portion of this contract or determine other terms than this contract in Individual Contract.

Article 5 Submission of Quotation

- 1) B shall submit quotation by request of A. And when requested by A, breakdown details of the quoted price shall be submitted promptly according to the requested forms by A.
- 2) In case of quotation, B shall not make any unfair action like as consult before the bidding and other matter.

Article 20 Inspection on Demand

If required, A may perform Inspection on Demand beside of Acceptance Inspection mentioned in Article 16, of material, parts, jigs and tools, equipment, facilities and so on which are used for the items of consignment manufacturing and even in the way of manufacturing, fabrication or repair of the ordered items at B's manufacturing facilities.

Article 27 Quality Control

When requested by A, B shall establish the Quality Control system to maintain quality of consignment manufacturing items according to the common quality control specification separately specified by A.

Article 38 Instruction

When it is necessary, A may indicate or instruct B in manufacturing technique, quality, delivery control, facility improvement and safety control etc. on the object items contracted.

Reference Material 7.3-4 Extracted part of “Promotion Standard based on Subcontractor and small Business Promotion Law” Article 3, Paragraph 1.

**Promotion Standard based on
Subcontractor and Small Business Promotion Law
Article 3, Paragraph 1**

June 11, 1986
Advisory No.209 issued by
Ministry of International Trade and Industry

No.3 Items relating to modernization of facilities, improvement of technique and mutual collaboration of works among subcontractors.

- 1) Modernization of facilities
- 2) Improvement of technique
- 3) Modernization of management control etc.
 - (1) Subcontractors shall make an effort to modernize management control and labor management by adopting an effective management method which is adequate to the actual situation of corporation management such as establishment of management plan for long range, management policy, profit plan, funding plan, facilities plan, production plan and so on, and to conduct value analysis and numeric management control system.

No.4 Items regarding the improvement of pricing method, delivery inspection method and other dealing conditions.

- 1) Improvement of pricing
 - (1) Dealings price shall be settled by negotiation between subcontractor and parent contractor based upon reasonable calculation method to include proper amount of profit with consideration of quantity, delivery, payment, quality, material cost, labor cost, other expenses and market price trend.
 - (2) The above-mentioned negotiation shall be made periodically for the items of continuous orders, or whenever order are placed for the items of non-continuous orders. A record of such negotiation shall be kept by both parties.

Fig. 7.3-4 Example of proposal and estimate request format

(The actual format for JASDF XT-4 Jet trainer aircraft)

Proposal and estimation Company

Spec.doc.No. :		Name :		Award want level: A . B . C . D	
system :		Part No. : (Temporary part No. acceptable)		Alternative Yes - Part No. () No	
N O	Item	Answer		Note	
1	ASIS · Remodel · Newly develop	ASIS	Remodel	Newly develop	
	6	Yes	No		
	Development cost (1980 year cost)				
	Cost of partial test body (")	Unit price	\$ × QTy =	¥	
	Cost of system test body (")	Unit price	\$ × QTy =	¥	
	Cost of product for prototype A/C (")	Unit price	\$ × QTy =	¥ (Escalation formula =)	
	Development cost total (")	¥			
	First article test	Yes	No		
	Development cost for mass-production	¥			
	Unit production cost (1980 year price)	¥ (Escalation formula =)			
3	Weight	K g			
4	Outer dimensions	L =	H =	W =	
5	Confirmed spec				
6	Liability	M T B F (Mean time to trouble)		Hours	
	Necessity of reliability test · Specification and cost if needed · Measure to prove the liability, if not needed	Need	Don't need		
		Spec. :	Cost :		
7	M T T R (Mean time to repair)	Hours			
	Periodic inspection, scheduled	Hours			
	Material cost and M/H for periodic inspection	Material cost : ¥	M/H :	HR.	
	Necessity for purchasing field equip	Need	Don't need, if it is required (¥)		
	Is it possible to repair at operator?	Yes	No	Reason	
	Manual exists or not (If not, estimate cost to make it)	Yes	No	Small adjustment	
	Is it necessary to repair at vendor?	Yes	No		
Do you promise to support during whole lifecycle?	Yes	No			
8	Operation cost of whole lifecycle	¥			
9	Schedule	Month			
	Test body for partial test	Month			
	Test body for system test	Month			
	Test product for prototype A/C	Month			
	First article for mass-production	Month			
10	License need or not licenser name	Already have	Necessary	Not necessary	
11	Ratio of domestic production	Cost side	%	Item	
12	Law and regulation	Law for aircraft production	Yes	No	Show the approved evidence when "Yes"
		Law for weapon production	Yes	No.	
13	Product history for aircraft	Aircraft name · Part number · Part name · unit price · (Year ¥), Development cost (Year ¥)		State the sales ratio for aircraft product in 1980 %	
14	Other specific characters				

A : Entirely want the awarded.
 B : Want to be awarded, if possible.
 C : Whichever to be awarded or not
 D : Decline

Table 7.3-3 Engineering specification and requirement sheet for RFQ (Example)

XX - Date	Engineering spec. and requirements for request for quotation		Approved by	Made by
Part No. and Nomenclature				
System		Quantity Per A/C		
The purpose and function of product				
Engineering specifications and requirements				
Special notes			Material to be attached with quotation	
Spec. and requirement for development test			1. Outside drawing 2. Function diagram 3. Performance 4. Weight 5. Schedule for component development and testing 6. Drawing and manual of similar product 7. Data of R & M	

Fig. 7.3-5 Example of table of contents and supplement to Design to Cost implementation plan document

<p style="text-align: center;">DTC implementation plan (To be approved)</p> <ol style="list-style-type: none"> 1. Development schedule with phased DTC report schedule 2. Purpose 3. Related documents 4. Objective WBS 5. Target cost (Yearly cost and conditions) 6. Basic policy 7. Organization 8. DTC steplist 9. DTC scheduled status 10. Policy of DTC for each step <ol style="list-style-type: none"> (1) Creation and approval phase of DTC Implementation plan (2) Basic concept phase of objective (3) Allocation phase of target cost (4) Plan drawing and specification control drawing (Draft) phase (5A) Purchase part and vendor selection phase (5B) Approval of specification control drawing (6) Manufacturing drawing and planning work phase (7) Prototype, engineering test and results data phase (8) Review phase before mass-production 11. Scheduled table of contents of phased DTC report 12. Formats to be used 	<p style="text-align: center;">Supplement to DTC implementation plan</p> <ol style="list-style-type: none"> 1. PMD 2. DTC matrix theme table of phased WBS to realize the target cost 3. List of detailed WBS phasing themes to realize the target cost 4. Price/cost breakdown table of present cost
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