

such payment, we have asked the Groups whether the emergence of a single main buyer of large machinery in the home market has in any way reduced the amount of co-ordination which they claim the turbine builder must undertake, whether it is an effect of the intercontracting arrangements that the same price is charged for a turbo alternator set even if supplied in circumstances where the services which the handling charge is intended to cover are not required, and more specifically whether this is the case in CEA contracts. The Groups have replied that the CEA's purchasing methods have not affected intercontracting arrangements for large machinery at all, and that the amount of co-ordination which the turbine builder must always undertake in connection with any complete set is unchanged. The CEA for its part believes that, either directly or through its consulting engineers, it takes a more active part than its predecessors in co-ordinating the work of the various contractors both in the factory and during installation, but it does not dispute that a special responsibility still devolves upon the turbine builder.

CHAPTER 11. STEAM TURBO GENERATING MACHINERY : OTHER GROUP AND INTERNATIONAL ELECTRICAL ASSOCIATION LTD. ARRANGEMENTS

(1) Conditions of Sale and Contract and Related Provisions

252. We have described in Chapter 5 the arrangements for standard conditions of sale and contract as applied generally to machinery covered by our reference: we are concerned here only with their detailed application under the Group and International Electrical Association Ltd. (IEA) agreements relating to steam turbo generating machinery in class (a). Most contracts for this machinery cover erection (although in export contracts the manufacturer's services may be confined to supervision) so that of the sets of standard conditions reproduced in the BEAMA "Brown Book", those including erection are usually the appropriate ones. The arrangements of the Groups and of the IEA extend the operation of the "Brown Book" first by making the use of one or other of the alternative sets of standard conditions obligatory for their members in certain cases and subject to certain provisos, and secondly by elaborating certain clauses. The general effect is that where members agree common minimum prices they also offer identical conditions of contract and must agree any subsequent variation with other members tendering on an enquiry.

253. In the home market signatories of Group agreements relating to both large and small steam driven turbo generating machinery are obliged under the terms of those agreements to observe "the rules" for the use of conditions of sale and contract set out in the BEAMA Council's "Instruction to Members". In the export market, Group agreements relating to small machinery provide that unless the purchaser puts forward any general conditions with his enquiry tenderers shall, unless otherwise agreed among them, tender either the appropriate BEAMA Standard Conditions or those of the professional institutions: when the purchaser does issue a set of general conditions, tenderers are to decide whether these conditions are acceptable, whether they should be modified or whether tender and contract shall instead be made subject to one of the "Brown Book" standard models. In the case of large machinery for export (prices for which are agreed within the IEA), the Group notification agreements provide only* that "every Signatory shall conform . . . to any . . . obligations . . . agreed

* Apart from a provision relating to repair contracts.

with the tendering Signatories on any particular enquiry". We have already noted in Chapter 5 that there are no provisions relating to contract conditions in any IEA agreement; the members concerned in a price arrangement do, however, discuss and agree the conditions which shall operate on any particular enquiry, and the procedure followed is generally similar to that of the Groups concerned with export prices. The IEA has told us that where steam turbo generating plant is concerned obligatory uniform conditions of contract are "purely a corollary to the fixed prices".

254. Under the Group agreements covering small machinery,* and under those covering large machinery in the home market, signatories must stipulate progress payments during manufacture in all tenders or contracts of a value of or exceeding £50,000 in the case of the home market or £100,000 in the case of exports. The agreements concerned specify the proportion of the price which must be paid during manufacture at the contractor's factory, namely 60 per cent. in three instalments of 20 per cent. each. Thereafter the balance up to 80 per cent. is to be met as and when the machinery is delivered from time to time on site (or in the case of exports, as and when shipped), and the remaining 20 per cent. in accordance with the appropriate clause of the BEAMA or Institution of Electrical Engineers' (IEE) Conditions used. These provisions are, however, qualified in the current Group home market agreements. Those concerned with small machinery provide that "where a signatory is unable to obtain these . . . payments in the contract, he shall give three days' notice to the Secretary that he intends to waive these payments", when all tendering signatories shall be free to do the same. In the case of large machinery the provisions do not apply to contracts for the Central Electricity Authority (CEA) (which constitute the greater part of signatories' home market business in large machinery), but progress terms of payment in a form agreed with the Authority are applied. Group agreements covering exports of small machinery provide for some flexibility in applying the terms specified where the purchaser will not accept them in the form first offered, but do not expressly state that the provision may in such circumstances be waived completely. The minimum value of contracts to which progress terms of payment have been applied has varied from time to time: the present export minimum of £100,000 was introduced in March, 1955, the level before that date being £50,000.

255. Although there is no express provision under most agreements, the signatories of the Group agreements and of the IEA Turbine Plant Export Agreement have included one of the BEAMA "Brown Book" Supplementary Clauses relating to contract price adjustment in the conditions quoted for home and export contracts since 1950. Until recently contract price adjustment has usually operated without a ceiling limit (see paragraph 120).

256. There is no provision in any of the Group agreements regarding the delivery dates to be offered on an enquiry and the Groups have told us that there is no understanding between the signatories on this matter. Agreement on the minimum delivery period to be offered is a feature of all price arrangements under the IEA, the period adopted being the shortest proposed by any party to the arrangement for the particular enquiry.

257. In addition to the provisions described above, all the relevant Group agreements lay down instructions on certain technical matters. Similar provision is made under the Turbine Plant Export Agreement. In the case of turbines these instructions provide that every signatory shall when tendering make use of appropriate specified "protective stipulations" relating to steam

* There is a specified variation in the terms for contracts for the U.S.S.R. and certain Eastern European countries.

consumption guarantees, standard tolerances, penalty, bonus and guarantee of blading. Signatories may tender without guaranteeing steam/heat consumption, in which case they are to stipulate that "all the figures . . . given . . . are based upon our experience and are those which we expect to obtain on test and are given bona fide": but where guarantees are given signatories must stipulate a standard tolerance (as laid down in the appropriate British Standard Specification*) of at least $2\frac{1}{2}$ per cent., subject to specified increases up to another 3 per cent. in certain circumstances. The maximum penalty which a signatory offers for each 1 per cent. by which the test results vary from the guaranteed figures may not be more than £180 per 1,000 kW (in the case of high pressure turbines†), "or that specified in the purchaser's original enquiry, whichever is the less", unless he gives seven days' notice of his intention to the Secretary, "naming the amount of the penalty which shall be the maximum to be offered and/or accepted" by any of the signatories tendering for the particular enquiry. Signatories must stipulate that "payment of any penalty . . . for failure to meet our guarantee (and which failure we shall in any event be given every facility to make good at the earliest moment) shall be deemed to be as and for agreed and liquidated damages for such failure". The standard form of guarantee to be used by signatories provides for the inclusion of both penalty and bonus; "in order to establish the custom of securing a bonus where a penalty is agreed it is strongly recommended that signatories shall stipulate for a bonus corresponding to the penalty". Permitted tolerances must be increased by a further 5 per cent. for small turbines and $2\frac{1}{2}$ per cent. for large turbines before the purchaser becomes entitled to exercise his right of rejection in accordance with the conditions of contract.‡ No signatory may guarantee the life of turbine blading beyond "the usual twelve months' maintenance".

258. There are provisions of generally similar effect for alternators and condensers.

259. One firm of consulting engineers has said in evidence to us that in its experience British tenderers "almost invariably insist" that their guaranteed tendered efficiencies shall be subject to testing tolerances laid down in the appropriate British Standard Specification. The firm says that these tolerances (up to ± 4 or 5 per cent. on guaranteed efficiency in some cases) are generous to the contractor. An analysis by the firm of 37 turbo alternator test results for United Kingdom plant shows that on average measured performance has been rather more than 1 per cent. below guaranteed performance, which, it says, would suggest that some United Kingdom makers are encroaching somewhat on the wide tolerances allowed by the British Standard Specification, although there is nothing to show that this is being done deliberately. A large tolerance makes it unnecessary for a contractor to take remedial measures and the deficient performance remains. From the purchaser's point of view the capitalised equivalent of a 1 per cent. difference in efficiency may be very high and may even perhaps amount to as much as 25 per cent. of the first cost of the plant.§ The firm makes the further points that the amounts of cash penalty and corresponding bonus offered by United Kingdom manufacturers in conjunction with efficiency guarantees are inadequate, afford insufficient safeguards to the purchaser and have remained unchanged for

* Namely BSS 132/1951.

† Figures for tolerance percentages and penalty differ in the case of other types of turbine.

‡ That is, by a further 5 per cent. or $2\frac{1}{2}$ per cent. over and above the tolerances laid down in British Standard Specification.

§ On a similar matter the CEA has told us that insofar as it can deduce the relationship between Group price and efficiency, the price increase for higher efficiencies is nothing like as much as the worth to the Authority of a lower heat consumption.

many years: higher penalties more in line with current manufacturing costs would favourably impress purchasers that guaranteed performance figures are sincerely estimated.

260. The Groups have told us that the tolerances in the British Standard Specification go back to 1930: they are at present in debate "at a high level" in the engineering field all over the world and it is felt that with the growth in size of machines and the accumulated experience of designers over the years, the tolerances could probably now be somewhat reduced. If the British Standards Institution wished to narrow the tolerances, however, it would not necessarily follow that all Groups would adopt the narrower limits in their own arrangements. The Groups add that penalty and bonus provisions are in practice rarely enforced.

261. The Groups say that performance is affected by design and workmanship, and these are the manufacturer's responsibility. They submit that there is no such thing as perfect workmanship and "turbines made to the same design are likely to show slight difference in performance". The same applies to design itself; "the original design ideas pass through many hands before working drawings are completed" and perfection again cannot be reasonably expected. The manufacturer's guarantee covers the likely errors in design and workmanship; but unforeseen errors may occur, particularly on a new type of machine developed in a hurry, as happened after the war. The Groups contend that "if 37 turbo-alternators showed an average of little over 1 per cent. worse performance than the guarantee, no one who knows all the processes and all the circumstances is likely to complain". They point out that inexperienced operators may cause damage to a turbine and that there is a lack of trained operators in many power stations. They submit that it is "unrealistic to imply . . . that the excess of a little over 1 per cent. is solely due to the manufacturers' imperfections".

262. Finally the Groups submit that "in common sense and in fairness some tolerance on the guarantees or test results is fully justified. Supposing the manufacturers were asked to guarantee and test without tolerance, they would obviously adjust their guarantee to cover the errors in testing.* Then in most cases the purchaser would have to pay bonus; if the turbine is suspected as unsatisfactory it would have to be opened up and rectified at the expense of the purchaser if the unsatisfactory condition (dirt, damage) is due to him. The turbine would then be out of operation for some time at probably serious expense to the purchaser . . .".

(2) Special Rebates on Bought-in Components

263. Until recently two arrangements have operated in relation to the supply of semi-manufactured components for machinery in class (a).† We have already referred to one of them, an arrangement between the Condenser Section of the BEAMA and the Condenser Plate Association, now no longer current (see paragraph 73). The arrangement provided for a rebate on purchases by the condenser makers of condenser plates for export land contracts, the amount of the rebate being related to the total volume of purchases by the condenser makers for both home and export contracts

* The Groups say that "the apparatus and instruments which can be used when testing are not always the same, and are liable to a varying degree of inaccuracy in themselves. Moreover, considerable skill is necessary to use these to full advantage. Hence a tolerance on the apparent results of tests is essential and recognised as such by users as well as designers".

† Both arrangements were considered in relation to the suppliers of the components in the Commission's Report on the Supply and Export of certain Semi-Manufactures of Copper and Copper-Based Alloys (HMSO, 1955), paragraphs 106, 110 (a) and 317 to 319.

in a given period : the rebate given was $\frac{1}{2}$ d. per lb. if the condenser makers' aggregate purchases amounted to 80 tons or less in any period of six months, and $\frac{3}{4}$ d. per lb. if the purchases amounted to more than 180 tons. The condenser makers who received this rebate are all members of the Condenser Groups.

264. Since 1945 the members of the Condenser Groups, acting for this purpose as the Associated Condenser Makers, have operated an agreement with the Brass and Copper Tube Association which provides for a special aggregated quantity rebate to be paid to the condenser makers, who for their part undertake to confine their purchases of tubes to specified makers of tubes. The rebate rates in this case range from $\frac{1}{2}$ d. per lb. on deliveries not exceeding 100 tons in the rebate period of six months to 1d. per lb. on deliveries exceeding 500 tons. The current agreement, which was formally concluded in 1947, supersedes an earlier one.

265. We have been told by the Groups concerned that the cost of tubes amounts on average to about 18 per cent., and that of plate to about $3\frac{1}{2}$ per cent., of the selling price of the condenser.

CHAPTER 12. MARINE EQUIPMENT

266. The two Group agreements relating to marine equipment in class (a) (see paragraph 154) are the Marine Turbo-Generator Agreement and the Ship Propulsion Equipment Agreement. They also cover some machinery in class (b).

(1) The Marine Turbo-Generator Agreement

267. The Marine Turbo-Generator Agreement, first concluded in 1937, has as its subject matter "any auxiliary steam turbine for generator drive or steam turbo-generator unit for use on board any ship of the Mercantile Marine* or any floating dock, built or fitted in any part of the world irrespective of whether such ship will fly the British flag or not, having an output of not less than 100 kW normal or economical rating or equivalent B.H.P.". The agreement thus covers supply in both the home and export markets of turbo generating units for purposes other than the main propulsion of the vessel. The term turbo generator unit in this context comprises a steam turbine, gearing and generator and in some installations† a condensing plant. There are eight signatories, all of whom are also signatories of some or all of the agreements covering small steam turbo generating units for use on land.‡

268. The agreement provides for the central notification of enquiries and orders, procedure being similar to that described for machinery for use on land (see paragraphs 165 and 166). Every signatory must include in every price tendered by him a sum for compensation for tendering expenses; the method of calculation (though not the formula actually used) and procedure for payment and subsequent distribution are similar to those under the land agreements (see paragraph 168). He must also include, as under the land agreements, a sum to cover the costs of administration (see paragraphs 61 and 178). Every signatory undertakes "not to offer and/or supply plant . . .

* "Plant for use on board ship or floating dock for the British Admiralty, Dominion Governments or for Governments of other Nations" is expressly excluded.

† Where a back pressure turbine is used, a condenser is unnecessary.

‡ Two of the eight joined in 1945.