The Chartered Institution of Building Services Engineers

Licentiate Application

Work Experience Report

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Word Count: 1,970

Professional Experience

After leaving school I attended Colchester Institute on a full time basis studying for a GNVQ (Advanced) Electrical/Mechanical Engineering and an NVQ2 (Foundation) Engineering Manufacture. Both courses were successfully completed by July 2001.

In September 2001, I joined Woods Air Movement as a technical apprentice. I was given day release to attend the Colchester Institute for the HNC in Mechanical Engineering.

The first three months were spent working in the factory, gaining experience in all the manufacturing process. The factory tour was then followed by a placement in the Service department. The first few weeks were spent in the workshop receiving deliveries, allocating job numbers, assisting in the inspection of returned items, dismantling fans, changing motors/bearings, packing repaired/refurbished fans and arranging for despatch. This was then followed by site visits with the service engineers which gave a great insight into the application of the products, routine maintenance and customer interaction. My time in the office was providing assistance with the spares quotations and reports for inspections/repairs/refurbishments.

My second placement was in the drawing office, after learning the system, I was asked if I would be willing to return to the Service department as they had felt the loss of my contribution. I accepted and served my entire apprenticeship with them. To satisfy my apprenticeship I would visit other administration areas to gain a full appreciation of the company. One visit was spent with the development laboratory performance testing an Air Handling Unit, we carried out an air volume test, sound measurement and tested the cooling load.

On completion of my apprenticeship (by which time the company was Fläkt Woods Limited) I given a permanent position with the Service department as Service/Repair Coordinator, this involved dealing with retuned items, liaising with the warranty team, writing reports and costing repairs/claims as appropriate. I also provided cover for the workshop supervisor. Scheduling the inspections/repairs/refurbishments, allocating labour to the jobs and keeping the computer system up to date.

In January 2006 I was promoted to Service Project Coordinator, managing and coordinating site works from order receipt to practical completion. Identifying/checking the parts required, scheduling labour, submitting RAMS and keeping updated on the progress of the project. Visiting sites for bigger projects and managing sub-contractors where required. Writing a completion report and submitting invoices. Issuing a profit/loss statement to assist in continuous monitoring.

In November 2006 I was appointed Spares Leader. I introduced a spares catalogue which involved analysing all the standard product range and identifying the spare components for each one, compiling a spreadsheet, adding sales margin and discount margin for the distributors. The final catalogue was compiled by myself and issued in pdf format. My next task involved setting up a 24hr delivery process.

In April 2008 some structural changes were introduced and I became an Account Coordinator. Providing quotes from specifications and aftersales support. These changes had a noticeable effect on the spares business and I was appointed Spares and Planning Coordinator in August 2008. Taking a more holistic approach to overseeing the spares activities by providing further procedures and training were possible. I would look at any orders in the factory that could not be delivered according to the customers required date. Checking the delivery of individual components and improve them where possible. I would look for alternative parts that could be utilised which may be on quicker delivery times. My final role was to manage two key accounts, each with a turnover in

excess £1m. Providing a quick and dedicated service, dealing with technical selections and order processing.

June 2010 my role changed to Service Sales Engineer. Which was later known as Service and Energy Solutions Engineer. Visiting clients on site (end users, contractors, consultants or FM providers), assessing the requirements, identifying the solution and providing quotations to carry out the work. Following up on quotations to ensure that the scope had been met and negotiating objections/dealing with questions. On receipt of the order, it would be processed by the office and allocated a job number before proceeding with the necessary checks and validations, scheduling deliveries and labour, completing and submitting RAMS, completion snagging, invoicing and providing reports. It was important within this role to keep upto date with developing fan technologies and other industry trends, so I would read the Fläkt Woods News Bulletin, attended seminars provided by ebm Papst. As our team grew, I shared my fan knowledge with other members of the team and taught them how to use the fan selection tools. I also subscribed to H&V News, FM World and Modern Building Services.
The following is an example of one of my projects;

The National Archives – Kew Gardens – AHU Upgrade
Initially invited to site by Bouygues regional energy manager to survey the four main supply units providing fresh air to the building we agreed a suitable time and date, then subsequently met on site. I met the client on site and we discussed their requirements. I was escorted into the basement plantroom and surveyed the units, it was immediately apparent that the units were manufactured by Woods Air Movement and were Airpac units. I noted down the serial numbers and site references and that at installation the site was known as the National Records Office (which would assist me in finding the records later). The client advised that they had another company looking at the controls and filters for the units and they wanted me to convert the fans to direct drive. Shutting one of the units down, I noted that the unit was installed with 2 mixed-flow axial fans which were operated on a run & standby configuration unless there was high demand, in which case both fans would operate. I gathered information on the operating schedule to provide assistance with the energy calculations later.

On returning to the factory, I searched for records and drawings of the units, which would provide me with further design and selection information. Once found, I searched for fan curves for the existing fans to provide a double check on the original selections. I used this information to get a new selection based on the same volume and pressure as per the existing units. I searched through various fan types to find the best solution whilst also balancing against cost so that a good payback could be achieved. I found that a direct drive plug fan was the best selection for this requirement. Using this data, I then tweaked the selection to include an IE3 motor and adjusted the performance and data characteristics based on the set point demands and the physical space within the unit. Whilst doing this I also analysed using multiple fans to assess further savings or controllability. I found that further to the direct drive selection it would be best to remove the run & standby configuration and instead run both fans continuously (fan laws denote that when running a fan at half speed it will consume half the power load. Therefore it is better to run two fans at half speed as this will use half the total power of a single fan running). I then selected the individual components and estimated the labour requirement for carrying out the works. This information was collated into a quotation along with my recommendations for running both fans continuously and a confirmation that no parts would be ordered until we have carried out 'as installed' set points as to date we have gone from design information. The quotation was complete with energy saving calculations which were based on readings from a data logger I had fitted to the distribution board for 1 week to gather exact operational data. It was noted that the system is driven by the external environment and that

we could only fit the logger to the supply of one fan so it was possible to miss high demand points. The predicted savings were presented on a graph within the quote.

During negotiations the client questioned the maintenance requirements of the new fans, how to prevent recirculating air in the event of fan failure and the possibility of the two fans 'fighting' each other. I advised that there would be less bearings in the assembly and no need for replacement belts or the associated costs in installing/checking them. The lack of belts also meant no particles or smells being transmitted into the archive rooms when a belt snaps. We added manual shut off dampers which could be closed by the maintenance staff (an actuator driven damper may have been a more integrated approach but the client wanted costs to be kept to a minimum). To ensure the fans operate in optimum compatibility I advised the client to ensure that the controls strategy kept both fans running at the same speed.

On winning this order my colleagues processed the order and allocated a job number. I arranged with the client to take a set of pre-works readings, as we knew what the unit was designed for and the exact fans installed I took a pressure reading using a digital manometer either side of the fan. These readings were taken for each fan and both fans running then repeated across all four of the units. I validated the readings on the existing fan curves then transposed them onto the fan curves for the proposed selections. The selections were then checked for ErP compliancy by calculating the FMEG rating before passing my final selections onto the office for ordering. I checked that all components were on order and arranged for the engineers to attend site to carry out their pre-work survey. The engineers confirmed to me what time they would require to complete the works and subsequently I was able to compile a project time line and confirm suitable dates with the client.

Owing to the security requirements on site and lack of action from the project manager, I was left in a position of having to supervise the engineers on site as I was the only person with suitable security clearance. I subsequently acted as on site liaison between the client and the engineers. This involved arranging the permit to work and ensuring the client had copies of the RAMS produced by the project manager. In my capacity of supervisor, it was important that I had also read these and was aware of any changes that may have been needed as our works progressed (for example a hot works permit was also required for cutting up the existing fans). I assisted the engineers in completing the works. A controls company had also been appointed by the client to carry out the necessary modifications to the BMS as and when our works were completed so I was also required to liaise with them.

The modification was carried out as planned and ahead of schedule. The unit was test run and measurements were taken to ensure everything was as it should be. The client was then invited down to survey the upgrade and witness the readings. This was a requirement of the contract owing to the critical nature of the units. We were then given the go-ahead to proceed with the remaining 3 units.

On completion of all works, the South unit was again fitted with the energy data logger for a period of one week and I handed the relevant information back to the project manager and asked him to produce the O&M documentation. In tandem to this, the units were handed back over to the site maintenance team and I gave them a hands on demonstration on how to maintain the units and what to do in the event of a fan failure. A project completion report was also compiled and handed over to the client. Below is the final energy report.

In November 2015 I was appointed Energy Consultant with Low Carbon Europe.