# **Mobile Work Order Process and Asset Management**

#### **Work Order Process**

Black & McDonald takes a very measured and structured approach to work management and the delivery of services. We utilize established systems and processes to guide the work that we do and provide our staff and subcontractors with tried and tested methodologies for the effective, timely, and safe completion of work. Over the last decade, we have engaged in thorough examination of our practices across the business and have developed a comprehensive set of Business Process Standards (BPS).

This includes focus on processes including Work Order Management, which outlines in detail how to properly set up contracts, create robust maintenance schedules, and generate reports that allow for supervisors and managers to properly oversee and manage the work and their overall contracts. Following best practices in generating and executing work orders helps eliminate surprises and ensures that our services deliver on contract expectations. As well, consistent work order processes allow for consistent training programs and more flexibility to readily leverage and deploy resources.

The Work Order Management process describes the various steps involved in managing a single Work Order. These steps include managing costs, purchases, priorities, and performance for all Service Work Order types.

These Service Work Order types include, but are not limited to the following:

- ✓ Preventative Maintenance Scheduled maintenance agreement visit
- ✓ Corrective/Emergency Maintenance Client requested service visit
- ✓ Work Recommendation Technician generated recommendation for repair work
- ✓ 'EARN' Visit Client review visit
- ✓ Small Jobs Service project work as agreed upon with the client
- ✓ Warranty Visit within the warranty period

We work with each client to ensure our work order process meets their requirements for their business and achieves the operational outcomes that they desire.

On the following page we present the framework for our Work Order Management process.



Figure 1 - Work Order Management Process

# i. Work reports are maintained electronically.

We confirm all work management functions, including work orders and work reporting are maintained electronically.

# ii. Tracking work orders/work reports, if applicable, including:

Our work order / work report platform is an integrated part of our overall JD Edwards Enterprise Resource Planning (ERP) platform. JD Edwards (JDE) ERP is our business process management software that manages and integrates our financials, supply chain, operations, reporting, work order management, and human resource activities.

The software's built-in asset management function has a specific set of rules regarding preventative maintenance and maintenance schedules that allow for proper work order entry, categorization, and management of the work to manage all aspects of equipment maintenance such as:

- Creating equipment register and information;
- Scheduling preventative maintenance;
- Receiving and responding to cases;
- Planning of parts and labour;
- Purchasing parts and materials;
- Assigning resources; and
- Tracking the status of preventative, corrective and emergency tasks.

The optimization of resources and processes, creates a comprehensive integrated work management system that allows us to track, schedule, and report on preventive and corrective equipment maintenance activities. The JDE platform allows for the seamless integration of work management tools

(i.e. work order and work reporting) and generates the required output for detailed work order reporting. Black & McDonald has committed extensive resources to optimize and bolster JDE with additional software capabilities to ensure our work order processes and reporting have the required level of detail for our customers.

Our work order management platform encompasses every aspect of information collection, storage, control and security, including financial, operational, HR, plans/drawings/procedures. Our work orders even provide additional detail regarding the parts list required and labor detail steps to the work order to assist in reporting on current activities and planning for future work requirements.

Another benefit of our work order management platform is it is non-proprietary and data can be extracted into various formats, including Excel and PDF, and then provided to the client in a usable, meaningful format for planning purposes. We have demonstrated this ability with numerous other clients with similar requirements.

# • Web-based customer access portal.

We can provide a web-based Customer Self-Service (CSS) access portal where required and valued by our client that allows approved users to log and track work requests and see various dashboards that are relevant to the performed in-scope work. With secure access granted to screened/approved individuals, this allows our clients to see the state of a single work request or a 'snapshot' in real-time of all work in progress within their portfolio, detailing whether it deals with one specific piece of equipment or insight into how the overall work is progressing within a single facility.

In support of our clients' requirements for ease of access to service delivery, we have developed a highly functional portal that allows for logging of work requests, viewing status of work requests, and access to reports, including:

- Customer input and review of work orders and equipment.
- Provides a direct window into our delivery approach and the progress of each undertaking.
- Can be set up with dashboards pertinent to the client to assist with tracking and reporting.
- Checking status of a work order using a number of methods to:
  - o Query
  - o Search
  - o Filter
  - o Report
  - Exporting data ability



Figure 2-Customer Self-Service Portal

Software integrates with Service Technician hand-held devices.

Our software utilizes the **DSI platform** to power and integrate with our hand-held devices in the field - This provides a mobile solution for Service Technicians, Supervisors, Contract Administrators, and Call Centre Agents. It seamlessly integrates with our JDE work management platform to provide quick access to Work Orders, Dispatch, Procurement, Inventory, Time Entry, location information, and the estimated time of completion of work. Through the use of tablet and smartphone devices, productivity while



performing on-the-job activities in the field has substantially increased.

Our Service Technicians' hand-held devices have boosted productivity while enabling data capture, visibility and communication even if they are offline. We have installed a robust technology framework in-the-field that is a mobile-first application that displays vital information to be productive and minimize down time. Our DSI solution provides real-time visibility in to resource location, jobs completed and inventory consumed. The mobile solution that we have in place also allows for:

- Enhanced overall service delivery and reporting.
- ✓ Enhanced Health & Safety no work can start before a Job Hazard Assessment is completed.
- ✓ Increased responsiveness and reliability.
- ✓ Reduction in paper reports.
- ✓ Measurement of our performance against any Key Performance Indicators (KPIs), particularly any that involve response and rectification times for demand/emergency work requests.
- ✓ Accurate recording of technician time on a daily basis, provides the ability to review technician times, reducing production of timesheets at the end of the day/week.

- ✓ Voice to text capabilities to record work order notes.
- $\checkmark$  Able to take pictures and attach them to the work order in real time.

We have included an example of an electronic Service Work Order on the following page.

Service Report						
Work Order 256090 Work Order Status:	1 Completed		Www.blackandmedonald.com			
CUSTOMER IN	FORMATION	CUSTOMER	EQUIPMENT			
CUSTOMER	HALTON DISTRICT SCHOOL BOARD	MAKE				
SITE	HALTON DISTRICT SCHOOL BOARD PO	MODEL				
	L7R 3Z2	SERIAL				
REPORTED BY	AMANDA CHATELAIN	EQUIPMENT TYPE	SITE			
CUSTOMER	104154	LOCATION	2050 GUELPH LINE			
REPORTED	REPLACE RT EXHAUST FANS	UNIT NO				
CONDITION FO	DUND - WORK PERFORMED - RECOMMENDA	TIONS				
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#### Summary – Inventory Management

Black & McDonald has the relevant expertise, knowledge and processes to assist our clients and expedite its goal of a comprehensive and updated inventory of its HVAC assets. This includes processes that consider the long term outcomes, i.e. methods to ensure database accuracy and integrity. Accuracy of inventory is critical and the larger and more dynamic it becomes the more important this functionality

# Upon onboarding of a new customer and on-going Black & McDonald commits to providing our clients a complete and accurate inventory.

Black & McDonald's process for managing customer-owned equipment and inventory includes leveraging its Enterprise Resource Planning (ERP) platform, JD Edwards (JDE), an oracle based software. JDE is an integrated applications suite of comprehensive enterprise resource planning software that combines business value, standards-based technology, and deep industry experience into a business solution that supports a diverse set of business operations, including, but not limited to:

- ✓ Inventory Management
- ✓ Asset Lifecycle Management
- ✓ Computerized Maintenance Management
- ✓ Supply Management (Procurement)
- ✓ Financial Management
- ✓ Order Management
- ✓ Project Management
- ✓ Human Capital Management

This platform, which is fully integrated within our service delivery solution, bridges all the activities from equipment inventory take-off and asset management to human resources, procurement and maintenance activities. This enables Black & McDonald to provide our clients with a robust Inventory Management consolidated model to enhance productivity, reduce costs and improve the overall management of HVAC assets.

We will leverage our experience and knowledge of your sites and equipment, and take a comprehensive and systematic approach to validation and updating of the Inventory assets. We will apply our tried and tested asset management processes such that the intake process ensures our administrators accurately capture the findings of our Technicians in the field for the validation of equipment on the sites. This includes electronic forms for the Technicians to utilize in the field that allow them to quickly and accurately complete equipment confirmation/edits and submit to the administrator for incorporation into the master file available ton clients, and reflected within our maintenance management platform and overall maintenance program.

Black & McDonald also recognizes the importance of effective document control and record keeping for the updated and complete Inventory. Black & McDonald will ensure the information remains accurate and can be utilized by clients for years to come.

We have detailed processes which include *Inventory Management* and *Inventory Labelling* to properly tag, categorize and inventory all of serviced assets. We can ensure that any new equipment/replacements are captured within our system/active Inventory.

In conjunction with the validation and integration of any Inventory List, Black & McDonald's Technicians throughout the work order process will verify that each piece of equipment has a sticker label, and that the current label on site contains correct information and matches the physical asset. We have specific labelling standards to ensure that Inventory under our care is properly tagged and categorized to ensure the ease of maintenance and capturing history of work performed on the piece of equipment to enable the tracking of costs at the equipment level as required.

# **Equipment Labelling**

The process of equipment labelling applies to client-owned equipment managed by Black & McDonald, and the labelling and identifying of the equipment. It ensures visual identification of all Black & McDonald managed equipment, as well as a more efficient way of tracking costs, maintenance history and other applicable information through standardized scanning and tracking.

The equipment label standards and naming conventions are as follows:

- Labels are generated using the ForgeLabel Program and printed on a DuraLabel printer.
- All data is imported directly from Excel to JDE to produce the Inventory Master List.

Manufacturer Description	Model # Spec Instr	Serial # Asset #	Equipment Number
TRANE	YCD210CWLAEB	P50102066D	694045
TRANE	YCD180BWLAEA	P50101194D	694046
CARRIER	48TFE006-A-111	3502G10193	694047
LENNOX	GCS16-048-120-6Y	5604K12962	694048
CARRIER	48TJE004-101QE	4994G20507	694049
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Figure 3- Inventory List Example in JDE



Figure 4- Black & McDonald Equipment Labelling Standards

#### a. Software and Technologies employed in inventory maintenance.

As described earlier, our JDE platform offers a comprehensive ERP software which encompasses the Computerized Maintenance Management System (CMMS), with integrated Inventory Management/Control Modules that we are proposing to employ in the maintenance of the inventory. This also includes the previously mentioned DSI platform software for integration with our mobile, hand-held solution.

Equipment assets and their attributes will be managed via Black & McDonald's CMMS work management module. Client facility asset numbers will be generated for each piece of equipment and can easily cross referenced against the database, and reports to the client based upon specific general ledger codes can be generated. Asset maintenance histories, Year-to-Date (YTD) costs and other specific asset information will be readily accessible and can be reported or analyzed via the ad hoc reporting tools.

We will ensure the CMMS will be utilized to plan, schedule, and control/monitor the Inventory, and can include:

Hierarchical based component identification		Frequency	
•	Description (make, model, serial #, capacity, etc.);	•	Scheduled dates;
•	Location;	•	Maintenance history including planned/unplanned;
•	Unique identification code;	•	Service provider (staff or contractor);
•	Maintenance job plan description including:	•	Status; and
	<ul> <li>Detailed maintenance procedures;</li> </ul>	٠	Notes including:
	<ul> <li>Warranty requirements</li> </ul>		<ul> <li>Inspection observations</li> </ul>

$\circ~$ Parts and consumables (e.g. lubrication requiremen	orts, or Recommendations
sizes of belts and bearings);	o Comments.
<ul> <li>Regulatory or statutory requirements; and</li> </ul>	<ul> <li>Frequency.</li> </ul>
<ul> <li>Special Instructions;</li> </ul>	

The CMMS formal structure and framework ensures logical and secure setup of Inventory. The development of diligent and thorough maintenance plans will provide a key element for detailed strategic asset management and inventory control. The CMMS manages all operating locations in a drill down hierarchy for easily locating each piece of equipment, system, or functional area. The physical relationship of equipment within a facility, the facility within its geographic location, or other hierarchy can easily be visualized indicated by the example below.



Figure 5- CMMS Drill-Down Hierarchy View

All Inventory Management task information (both planned and demand based work), whether the asset is critical piece of equipment, warranties, and equipment life expectancy are all tracked by the CMMS. By adding these additional fields to further categorize the inventory, we can create additional value by providing insight into performance of the asset, not only the make and manufacturer of the equipment.

The CMMS will schedule all preventative maintenance tasks throughout the client's portfolio. This will ensure all equipment are scheduled for routine servicing, tests, inspections, certifications and subcontract work. This also includes capturing the required supplies, materials and parts as it relates to the work.

# b. How a client would access inventory where available

# SharePoint

B&M utilize Microsoft SharePoint as a collaborative work space, for the dissemination of reports, storage, and retrieval of electronic information. As mentioned earlier, we can create a SharePoint site to house the Inventory data and make it viewable, editable and downloadable.

Further information on SharePoint:

#### ✓ Collaboration:

Documents stored on SharePoint can be accessed by all approved individuals. This includes relevant file types, including CAD, BIM, images, etc. Permission levels on documents will determine whether an individual or group has read only access, the ability to post new documents or to make changes to posted documents. To ensure that two people working on the same document do not overwrite each other's work, SharePoint utilizes a library-type system that allows a user to "check out" a document to work on it. Other users may view the original document but cannot save new versions until the document has been checked back in.

Notification of postings and updates can be sent to identified team members and personnel.

#### ✓ Document Storage:

SharePoint can store virtually any kind of electronic file. An extensive search engine built into SharePoint allows for the easy search and find of files within libraries or globally across the site. SharePoint is accessible anywhere and at any time from an internet connected computer or laptop with a standard web browser. Security is maintained through password and server redundancy and is part of the Black & McDonald IT Services mandate.

# ✓ Reporting:

SharePoint is used for the delivery/posting of reports. Report summaries with links to supporting documentation and the supporting documentation are posted to SharePoint and a link to the report emailed to the distribution list. SharePoint tracks access to the report providing confirmation of delivery.

To ensure the ability to access the Inventory in order to view, edit, and download, Black & McDonald has the capabilities to export and produce a flat file (Excel Spreadsheet). Once the modifications have been made to the exported Excel Spreadsheet, Black & McDonald can re-upload the revised data into JDE and the CMMS seamlessly. The flat file can also be validated by Black & McDonald to determine if there are any errors or inconsistencies.