

Section 3320 – EHS Considerations in Construction Projects

Current Revision Date: June 15, 2006

Draft for Final FES Review

1.0 Objective:

- 1.1 The objective of this guideline is to ensure that a) our construction projects are safe for Company employees, contractors, subcontractors and third parties b) that we comply with the Environmental Health and Safety (EHS) requirements of all authorities having jurisdiction over the project location, and c) that we comply with the requirements of Company EHS policy and the Company EHS Reference and Training Guide.
- 1.2 The guideline outlines for project managers a practical step-by-step approach to construction-safety practices through all stages of a project, and that is consistent with Company's EHS Requirements, and in particular Policy 21.1 Contractors, Suppliers and Procurement Policies.

2.0 Scope:

- 2.1 This guideline is applicable to all Company Business Units and operating entities worldwide, including joint ventures where Company has a majority interest, for projects requiring more than either 30 calendar-days or 500 person-days on site. It applies to design only, design and construction, construction only and process / utilities installation projects.
- 2.2 The recommendations of this guideline must be followed on ALL projects for which Facilities Engineering Services (FES) has direct project responsibility and FES recommends that this guideline be adopted on all projects.

3.0 Introduction:

- 3.1 The expectation of safe working practices on construction projects is consistent with Company's values, and EHS policy. The requirements for the latter are defined clearly in EHS policy document 21.1 .
- 3.2 To be successful, construction safety and environmental considerations need to be an integral part of project implementation methodology, and should be part of the project planning process starting with project initiation. This guideline makes recommendations to be followed by the full project team, and the project manager should share the recommendations of this guideline with all team members and ensure that the requirements are met in a timely manner.
- 3.3 Company's EHS policy has well defined requirements for construction safety, which must be followed during the implementation of construction projects, however the requirements vary according to the size and nature of the contractors activities. It is recommended that the project managers familiarize themselves with EHS policy 21.1, and in particular the Contractor Requirements Matrix section 21.1.4. Note: This document is a guideline, and as such is intended as an aid to project managers in achieving safe construction activities and in the implementation of EHS policy 21.1 It is in no way intended to amend the requirements of that policy.

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4.0 Definitions:

- 4.1 FES – Facilities Engineering Services
- 4.2 EHS – Environment, Health and Safety
- 4.3 'Large Construction Projects' are those projects that have a construction phase involving more than 500 person days on site.
- 4.4 'CHESS': Company's Contractor Health, Environment, Safety and Security training resource, available in several languages in CD or e-learning formats from Company EHS group
- 4.5 A/E Consultants – Architect Engineering Consultants
- 4.6 CM – a professional Construction Management Company appointed to manage contractor's activities on behalf of Company, usually as an agent.
- 4.7 EMR – Experience Modification Rate, an insurance industry measure (USA only) of a contractor's insurance claims history.
- 4.8 EHS Plans – plans that contractors are required to submit and follow during execution of construction projects and which are defined in EHS policy 21.1

5.0 Design Stage:

- 5.1 The construction safety experience, philosophy and performance record of A/E consultants should be taken into account along with technical competence when selecting consultants for a project.
- 5.2 EHS obligations, including compliance with all EHS laws, should be discussed with all A/E consultants prior to contract award, and the contracts should include appropriate wording per the attachment Annex 'A' included in section 9.0 of this guideline.
- 5.3 All A/E consultants should receive general EHS orientation/ training such as CHESS, and specific training appropriate to Company specific hazards that they and contractors may encounter while performing work on site –see EHS policy 21.1.4 Contractor Requirements Matrix.
- 5.4 At the commencement of the design phase, the project manager should inform the A/E consultants of all Company site-specific EHS requirements for the project, as well as Model EHS Design and Construction Requirements for New or Upgraded Facilities (EHS RT Guide Checklist 21.4.2 – link). These requirements must be addressed in the design and construction phases, and issues that affect cost should be addressed prior to finalization of project funding requests.
- 5.5 The project manager, the A/E consultants and facility EHS manager should identify all applicable EHS laws, and all EHS and Construction Permit requirements during the design phase. These must be reviewed with the facility or regional EHS manager prior to the start of construction on site. The EHS manager has an obligation to document the results of those reviews. (A suggested method to help with the preparation of this list of laws and permits, and to identify risks is to hold routine 'brainstorming' sessions during the design and construction phases with both the design team and plant personnel. An example of such an

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approach is the ROAD (Risk & Opportunity At Design) approach developed by one construction management (CM) contractor and which is shown in annex 'B')

6.0 Bidding Phase:

- 6.1** All potential contractors for 'large construction projects should be checked for their company in-house construction safety policies and practices. Short listed contractors should be screened for construction safety performance (where permitted by law) and reference sites should be visited where possible. The results of the screen should be used as one of the key considerations during contractor selection. Project Managers and Construction Managers responsible for contractor or sub-contractor selection or nomination on behalf of Company should be required to do likewise. An example of a screening document is shown in annex 'C'. Key information to be obtained should include the following, where permitted by law, for the previous 3 years:
 - 6.1.1** Number of recordable injuries and illnesses
 - 6.1.2** Number of lost workday incidents
 - 6.1.3** Number of fatalities
 - 6.1.4** Man-days worked
- 6.2** Insurers Experience Modification Rate (EMR) (Note: EMR is applicable to contractors only in the USA. Where EMR information is not available then other methods may be considered, i.e. claims that a contractors employees may have made against social welfare funds)
- 6.3** Note: Company does not have a recommended maximum EMR above which a contractor should not be considered for a project. However many major companies have policies requiring the selection of contractors to be restricted to those with EMR's <0.99. If contract awards are made to those with EMR's > 0.99 many companies require that the contractor commit to additional safety measures, or be subject to additional supervision.
- 6.4** EHS Policy 21.1 requires that all facilities must define contractor EHS requirements, including general (such as CHESS) and site specific requirements, prior to awarding contracts. This means that the project manager should work with the EHS manager to agree those requirements and include them in the final bidding documents. Contractors should be required to include an allowance within their quotations for full compliance with the requirements.
- 6.5** Similarly contractors on larger projects (see EHS policy matrix 21.1.4 – link) are required to provide in their bids for both the submittal of EHS Plans, and compliance with those plans. Bid documents should define these requirements, including the elements that are expected to be included in those plans, for which details may be found in EHS Policy 21.1.2.g
- 6.6** For all construction, renovation and facility maintenance projects, Company EHS Policy 21.1 requires the project manager to include in the contract the following or comparable language approved by Company legal counsel:

'The Contractor shall comply with all environmental, health and safety (EHS) laws, as well as all site-specific and Company EHS Contractor requirements. If the company requires the Contractor to have an EHS Plan, Contractor shall also comply with the provisions of the plan'

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- 6.7** For all large construction projects, alternate and more detailed contract language is required per EHS RT Guide (see section 21.3.1). It is recommended that the project manager discuss these contractual obligations with the contractors' management team prior to contract signing, to ensure that they are fully understood.
- 6.8** Each facility has the obligation to communicate relevant risks (relating to Company operations at that site) and Company's requirements to contractors. That should be done through the project manager and formal project management structure wherever possible. Communication of risks should be ongoing throughout the project, starting with pre-contract award discussions.
- 6.9** Where the project is to be managed by a Construction Management Company (CM) on behalf of Company, the construction safety experience, philosophy and performance record of CM consultants should be taken into account along with their technical competence.
- 6.10** EHS obligations, including compliance with all EHS laws, must be discussed with all CM consultants prior to contract award, and the contracts should include appropriate wording per Annex 'D'.

7.0 Implementation Phase:

7.1 Construction start-up:

- 7.1.1** Each facility has an obligation to be aware of ongoing EHS issues relating to contractors' work, and the project manager/ construction manager should routinely communicate contractor issues and status to the facility, normally through the EHS manager or their designee.
- 7.1.2** Prior to the start of work on-site for new construction or significant modifications to existing facilities, the project manager together with the facility, business or regional EHS manager must review all laws that require approvals, reviews or other activities prior to construction start. The EHS manager must document that review. All laws must be complied with before work starts, including any preparatory site works.
- 7.1.3** The project manager must communicate Company's site-specific EHS requirements for the project, as well as Model EHS Design and Construction Requirements for New or Upgraded Facilities (EHS RT Guide Checklist 21.4.2 – link) to the CM if used and to all contractors prior to the start of work on site. This could be through either design or contract documents, or direct communication.
- 7.1.4** All CM employees and contractors must receive general EHS orientation/ training such as CHESS, and specific training appropriate to Company specific hazards that the contractor may encounter while performing work on site –see EHS policy 21.1.4 Contractor Requirements Matrix. (Note: this means all contractors employees on site, not just representatives of each contractor) The project manager should work with the appropriate EHS manager to ensure suitable training is available in advance of contractors commencing work on site.
- 7.1.5** Contractors must provide their EHS Plans, per their contractual obligations, to the project manager prior to commencing work on-site. The project manager must review these EHS Plans and agree them as soon as possible, after consultation

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with the facility or regional EHS manager. Any changes that are required should be agreed with the contractors as soon as is reasonably practical and the EHS Plans should be updated. (Note: the minimum elements to be included in these plans are defined in Section 21.1.2g of Policy 21.1

- 7.1.6** At the start of project implementation the CM should be requested to participate in a routine project team review and updating of the list of applicable EHS laws, and all EHS and Construction Permit requirements.

7.2 Construction Phase:

- 7.2.1** Project managers and all project staff should be encouraged to include construction safety observations as an ongoing part of every visit to site during construction. Contractors' activities should be checked for compliance with their submitted and agreed EHS Plans and also for general safe working practices. As an aid to this process a reference list of points that may be checked is included in Annex 'E'
- 7.2.2** EHS Managers have an obligation per Company policy to conduct a monthly general EHS walk-through of work areas on large construction projects (more frequently on smaller projects per EHS policy matrix 21.1.4 – see link) to confirm contractor conformance with contractual EHS obligations. Where possible the project manager should participate in this walk-through and any observations should be brought to the attention of the contractors as soon as possible. It is preferably that this is done through established project management procedures, normally this means through the project manager or CM staff. (NOTE: In emergency or highly hazardous situations Company reserves the right to immediately stop the work of any contractor) At locations where there is no existing EHS facility contact the project manager must conduct a periodic, preferably monthly walk-through, which should be documented.
- 7.2.3** Contractors should be required to conduct their own independent inspections of their site operations, and routinely report both their findings and the status of their corrective actions to the project manager in a timely manner. It is recommended that contractors be required to report immediately and in writing all incidents involving death, bodily injury or major property damage. Such reports should include identification of cause, details of proposed corrective actions. The project manager should review this information with the responsible Company EHS manager.
- 7.2.4** Project procedures should include a system for communicating with contractors on safety matters. It is recommended that construction safety is the first topic on the agenda of each routine meeting between project manager, CM and contractors. If possible the facility EHS manager or their representative should participate in the first part of that meeting. Minutes of these meetings should be kept as part of routine project documentation.
- 7.2.5** It is important that contractors remain responsible for contractor employee safety and for their working practices, whether or not these are described in the contractors safety plan. Agreement by Company to those plans, and by our defining site-specific requirements, performing periodic site inspections and

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providing feedback on safety issues is not intended to relieve contractors of their contractual responsibilities for safety.

7.2.6 We believe that contractor safety performance records are an important tool for use by the project team. They aid construction safety decision-making, and in particular whether or not to award further work to contractors. The following information must be documented on all projects that are managed by FES:

7.2.6.1 Number of recordable injuries and illnesses (incidents)

7.2.6.2 Number of lost workday incidents

7.2.6.3 DART's (Days Away, Restricted activity or Transferred)

7.2.6.4 Number of fatalities

7.2.6.5 Man-hours worked

7.2.7 See annex 'F' for an example of FES Construction Safety Performance Data Collection Spreadsheet.

8.0 Scope changes

8.1 Project scope changes during execution require careful consideration, as these may require new or revised permit approvals, may introduce new previously un-assessed risks, or may require changes to Contractors Safety Plans. The project manager should communicate those changes to the applicable EHS manager prior to implementation.

9.0 Comments and Questions on Guidelines:

9.1 Users are encouraged to provide comments on these guidelines, and to suggest additional subjects or content for inclusion in future updates. Additional information, or answers to questions on guidelines may be obtained by emailing the Guideline Team Leader at Facilities Engineering Services in or the Content Owner.

10.0 Attachments:

- Annex A Contract attachment for Architect/ Engineering (A/E) contracts.
- Annex B Model form 'Risk and Opportunity At Design'
- Annex C FES model contractor screening document.
- Annex D Contract attachment for Construction Management (CM) contracts.
- Annex E Construction Site Safety Checklist
- Annex F FES Construction Safety Performance Data Collection Spreadsheet.