Intensity-modulated radiation therapy delivered with MLC in the step-and-shoot mode uses multiple static MLC segments to achieve intensity modulation. For typical IMRT treatment plans, significant numbers of segments are delivered with monitor units of much less than 10. The ability of the linear accelerator to deliver small MU segments accurately in this mode has been studied by many authors and several studies have pointed out large discrepancies between the intended and delivered segment MUs which are dose-rate dependent, with some small MU segments completely missed. Since the specified total MU is accurately delivered, this causes a redistribution of the segment MUs. The dosimetric effects of this phenomenon have not been studied in detail. We have undertaken a systematic study to evaluate the dosimetric errors caused by the delivery error on a Varian 2100 C/D with 120-leaf MLC. We hypothesized that the MLC log files, which are created automatically by the MLC workstation and can be retrieved, record what the system actually delivered. These files can be used as a QA tool to evaluate the delivered patient dose. Information contained in the log files was validated using test MLC patterns. For the head and neck plan studied, dose discrepancies between the planned and delivered dose distributions mostly lie in regions between targets and critical structures. This raises concerns over patient immobilization and organ motion with this MLC IMRT delivery methodology. Work is currently underway to experimentally validate the accuracy of the log files and the existence of these dose discrepancies.