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## **Answering the Challenge of IDRC and IRC – A proposed solution from Razor Risk Technologies Inc.**

### ***What are IDRC and IRC?***

The Incremental Default Risk Charge was introduced by the Basel Committee to ensure that banks adequately measure and capitalize their risk from potential default events in their trading book. IDRC was introduced in October 2007 and was originally intended to be implemented by January 2010. The Basel Committee revisited the IDRC requirements in response to the large, un-capitalized credit losses that have taken place for major financial institutions in 2007 and 2008, and superseded the IDRC proposal with the more comprehensive Incremental Risk Charge (IRC) framework in July 2008. The IRC approach captures the risk associated with additional 'Events' as well as the original 'Default' event covered by IDRC. Additional 'Events' include Credit Migration, Equity Price movements and any other event that can significantly impact the price of credit positions.

### ***What are the mandated Implementation Timeframes for IDRC and IRC?***

There are 2 deadlines associated with the IDRC and IRC requirements:

January 1<sup>st</sup> 2010 – IDRC requirements must be fully met in addition to the implementation of Credit Migration events for the IRC calculation.

January 1<sup>st</sup> 2011 – Full implementation of IRC requirements, incorporating all remaining price risks for credit positions (i.e. risks that are unrelated to defaults and credit migrations)

Fallback Option - There is the option of a temporary fallback for the January 1<sup>st</sup> 2010 deadline (for one year) where capital on the Trading book can be charged as if the position were held in the banking book which would lead to an increased regulatory capital charge. There is no fallback option for the January 1<sup>st</sup> 2011 deadline.

### ***How are IRC and IDRC calculated?***

IDRC and IRC are calculated over a one-year capital horizon at the 99.9 percent confidence level, taking into account the liquidity horizons of individual positions or sets of positions.

The IDRC calculation requires the modeling of default events and the calculation of losses in the event of default over the capital horizon. The January 1<sup>st</sup> 2010 IRC calculation requires the modeling of credit migration events as well as credit defaults. The resultant exposure profile will include any price changes resulting from a change in credit rating over the capital horizon.

The January 1<sup>st</sup> 2011 IRC calculation is more sophisticated, requiring the modeling of additional events and the capturing of any correlation between these events, such as the correlation of market rates and credit events.

There are additional subtleties that need to be taken into account in the calculation such as liquidity horizons and the constant level of risk assumption which enables the portfolio to be dynamically changed over the capital horizon in response to an event occurring. Correct modeling of both of these factors will have a significant impact on the resultant capital requirements.

The IRC encompasses all positions, regardless of their perceived liquidity, except those positions whose valuations depend solely on commodity prices, foreign exchange rates, or the term structure of default-free interest rates (“non-IRC market factors”).

Example IRC products include: debt securities, equities, securitizations of commercial and consumer products, and other structured credit products as well as derivatives referencing such instruments.

### ***Challenges in Implementing an IDRC/IRC solution***

The initial IDRC requirements were relatively straightforward, but the introduction of the IRC Phase 1 and Phase 2 requirements has significantly increased the complexity of implementing a solution to meet the regulatory requirements. There are a number of key implementation factors that will need to be weighed up to determine how to meet these requirements. These requirements are part of the Market Risk regulatory requirements but the functionality required is more typically the domain of credit risk solutions.

**Timeframe** – The January 1<sup>st</sup> 2010 implementation deadline is only 13 months away, so implementation of a fully vetted, working solution is still feasible – but meeting these timeframes requires that planning, budget, resource, buy vs. build and regulatory discussions be started as soon as possible.

**Credit Loss and Migration Modelling** – The IRC framework requires the simulation of credit losses and migrations over a 12 month horizon and then calculating the change in portfolio value when a credit event occurs. There are 3 major components required to model this correctly, and typically, existing market risk systems will only adequately cover item 2.

1. Modelling changes in credit ratings through time taking into account migration probabilities and correlations of credit parties
2. Pricing models to determine the change in position value in the event of a rating change
3. Extensibility to include modelling of market rates and other events to meet IRC phase 2 requirements

**Dynamic portfolio management** – The constant risk and liquidity horizon aspects of the IRC and IDRC calculation require the portfolio of trades to be dynamically modelled over the capital horizon. Trades can be dynamically replaced with trades of equivalent risk during the simulation to ensure the portfolio remains balanced over the 12 month horizon. Dynamic portfolio management will enable banks to significantly reduce the regulatory capital requirements but is complex to implement and is not typically available in market risk systems that only calculate risk out to a 10 day horizon.

**Performance** – A 99.9 confidence interval on a portfolio of highly rated products will require a large number of simulation paths to be run to produce statistically significant results. The number of paths will be from 100,000 to several million depending on portfolio composition, so the performance challenges are considerable, especially for front-office orientated market risk systems that typically run hundreds rather than millions of scenarios.

**Evolving requirements** – The IRC requirements were released in the form of a consultative paper in July 2008 inviting comments back by 15<sup>th</sup> October 2008. The requirements have not been updated based on these comments to date. The liquidity horizon and constant risk requirements are also likely to evolve over time as they can have a significant impact on the calculated regulatory capital. The evolving requirements create additional implementation challenges along with the short timeframes.

**Multiple Deadlines** – The initial IDRC requirements are relatively simple compared to the Phase 2 IRC requirements. Phasing of a solution that meets the IDRC requirements for January 1<sup>st</sup> 2010, but can be extended to meet the IRC January 1<sup>st</sup> 2011 deadline, will require thoughtful design so that the immediate solution for IDRC/IRC phase 1 can then be extended, rather than rewritten, to meet the more complex IRC Phase 2 requirements.

### ***How can Razor Risk Technologies help?***

Razor is an integrated market and credit risk system that provides the functionality required to meet both the January 2010 and January 2011 IDRC/IRC requirements. The key IDRC/IRC implementation factors are all addressed through a combination of the Razor functionality and the input of our experienced risk management consultants:

**Timeframe** - Our existing clients already use Razor to model credit default and event risk for their trading book, so we are able to provide an “out-of-the-box” solution coupled with a proven implementation track record to meet the January 2010 and January 2011 regulatory requirements. This significantly reduces implementation timeframes and costs by changing the project from a software engineering and vetting project to an integration and configuration project.

**Credit Loss and Migration Modeling** – Razor includes an integrated Monte Carlo simulation based credit migration and market rate evolution model. Razor simulates market and credit risk factors forward in time based on input risk factors and correlations. As such, Razor’s simulation model provides full support for all of the IDRC and IRC modeling requirements.

**Dynamic portfolio management** – Razor fully supports dynamic portfolio management, enabling our clients to model their portfolio behavior dynamically during the simulation process based on their own configurable business rules and requirements. Trades can be rolled over or fully or partially unwound dynamically and across configurable liquidity horizons in response to changes in credit or market risk factors during the simulation.



**Performance** – Razor’s distributed processing architecture supports the parallel simulation of millions of scenarios. The scenarios are run concurrently on a low-cost hardware platform and results are then aggregated and presented to the risk manager. Existing Razor clients already run millions of scenarios on large trading portfolios, so Razor is already proven to meet the IDRC/IRC performance requirements.

**Evolving requirements** – Razor is a highly configurable system designed to meet the rapidly evolving requirements of a diverse client base in a single software product. This high degree of configurability enables our clients and onsite consultants to quickly configure changes based on evolving requirements rather than requiring changes to the core product.

**Multiple Deadlines** – Razor’s existing support for both Phase 1 and Phase 2 IRC requirements will enable our clients to immediately implement a solution to meet the January 2010 deadline and then evolve their Razor configuration to include the additional events required for the January 2011 deadline. This phased approach will significantly reduce implementation costs, project risks and business disruption so the challenges of fulfilling the IRC deadlines are fully met.